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NOTES ON SOME NORTH AMERICAN MEDICINAL PLANTS.

By John M. Maisch.

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In a paper bearing the same title as the present one, which I presented last year (see *Am. Jour. Pharm.* 1890, p. 331), some account of *Colorado cough-root* was given, and it was suggested that it was, probably, derived from a species of Ligusticum. Shortly after the publication of the paper my supposition was confirmed by a letter from Mr. John Kochan, of Denver, who stated that "Mr. Ebert collected and identified the plant in 1888, as well as myself in 1889, mention of which is made in *Botanical Gazette*, vol. 14, p. 278 (1889)." The reference alluded to reads as follows:

Ligusticum filicinum, *Watson*, was collected in great abundance near Lake City, Colorado, by E. J. Ebert, in 1888, and in the mountains back of Denver, by John Kochan, in July, 1889. This is the "Osha" of the Indians, who use its very large aromatic roots. It was referred to L. apiifolium by Rothrock in report of Wheeler's Expedition, who collected it about Twin Lakes, Colorado.

The origin of Colorado cough-root being established, another interesting question is opened as to the identity of this Colorado Osha with the *Osha* from New Mexico, described by Wm. Procter from specimens received from Jacob Krummeck, Santa Fé, N. M. (see American Journal of Pharmacy, 1867, p. 202). From incomplete botanical specimens sent by Krummeck, Elias Durand (*ibid.*, 1868, p. 106) referred the probable origin of this root to *Daucosma*

laciniata, now known as *Discopleura laciniata*, which is very common in Western Texas and New Mexico; immersed in boiling water this root has a very strong smell of carrot. It was chemically examined by Herman Haupt (*ibid.*, 1873, p. 347). To the writer the odor of this root suggests that of lovage, and also in general appearance and in structure it resembles the Colorado root; but the latter, probably, does not grow in New Mexico, at least "Coulter's Rocky Mountain Botany" gives the Wahsatch and Uinta Mountains and Wyoming as the range of distribution of this plant, and does not enumerate the species of Discopleura among the plants growing in the Rocky Mountains. It is not unlikely that the Indian name *Osha* may be used in different localities for different species having similar properties; the New Mexican Osha may, therefore, be derived from one of the Southwestern species of Ligusticum or of Discopleura, and the question cannot be definitely decided until complete botanical specimens of the parent plant can be examined.

While the roots of many species of umbelliferæ are aromatic, carminative and stimulating from volatile oil, it is well known that acrid or narcotic properties pervade in some plants of this order. From time to time cases of poisoning have been reported from eating what has been called *wild parsnip root.* The cultivated parsnip, *Pastinaca sativa*, is widely esteemed as a valuable esculent, and since it has become thoroughly naturalized in many parts of the United States, the question as to its poisonous qualities, when growing wild, is certainly a most important one, but in the writer's opinion has been settled in the negative; see account of "the wild parsnip (*Pastinaca sativa*)" by Prof. F. B. Power in "Contributions from the Department of Pharmacy of the University of Wisconsin," No. 2, p. 43. From the root of this plant Jos. T. Bennett (*ibid.*, p. 39) could not obtain any poisonous principle, nor did the cooked root produce any symptoms of poisoning in a cat.

A case of poisoning by "wild parsnip" occurred in April last in Du Bois, Pa.; three of the children who had eaten it died within three hours, and four recovered. Mr. C. J. C. Boyles sent me some of the fresh roots, which were easily recognized as coming from an umbelliferous plant; but when, after a prolonged absence from home, the specimens reached me, the few leaves were not in condition for determining with certainty the plant, which appeared to be either Sium cicutæfolium, *Gmelin*, or Cicuta maculata, *Linné*. One

of the roots was planted, and is at this date beginning to flower, and from the character of the stem and leaves is easily recognized as the species of Cicuta just mentioned. That this plant, and more particularly the root, is very poisonous is stated by most writers on American plants. Dr. Darlington (*Flora Cestrica*) writes that "the lives of children, and others, are often endangered and sometimes destroyed by eating the root in mistake for that of *Sweet Cicely* (Osmorrhiza longistylis, *D.C.*)," and that "the herbage is also said to be destructive of cattle, when eaten by them." Since the sweet cicely has a distinct anise-like odor, the root of cicuta cannot well be mistaken for it. Dr. W. P. C. Barton (*Compendium Floræ Philadelphicæ*) describes the odor, taste and smell of cicuta as being "remarkably sweetish, aromatic and warm." Dr. R. E. Griffith (*Medical Botany*) says: "The whole plant in a fresh state is poisonous; but by drying, the stem and leaves become innocuous, and are eaten by cattle without danger. The root, however, is the most active portion; it has a strong, aromatic taste and odor, and the cortical portion contains a yellowish viscid juice."

The common names, by which the plant is known in different sections of the country, are *water-hemlock, spotted cowbane, beaver-poison, snake-weed, and musquash;* in Mr. Boyles' letter I have for the first time noticed the name of *wild parsnip* applied to it; but it is very likely that many of the cases of poisoning reported by plants of the latter name were really due to the cicuta.

Two years ago (*Botanical Gazette*, 1889, p. 18) a case of death was reported, a farmer in Iowa having mistaken this root for an artichoke. So it seems that the fleshy character and agreeable odor and taste render this root as particularly dangerous by mistaking it for others, which are edible and harmless.

That the fruit of Cicuta maculata contains a volatile alkaloid was shown by Joseph E. Young (see AMER. JOUR. PHAR., 1855, p. 289), and has quite recently again been demonstrated by R. Glenk; but whether it is identical with coniine or with the little-known cicutine of Polex and Wittstein has not been satisfactorily demonstrated. Both investigators did not succeed in isolating from the root a similar alkaloid, to which possibly its virulent properties might be due. It deserves to be mentioned in this connection that in 1868 Van Ankum was likewise unsuccessful in obtaining from the root of the European species, *Cicuta virosa*, either a

volatile alkaloid or a crystalline principle possessing the poisonous properties of this plant; the *cicutoxin* of R. Boehm and Trojanowski (1876, 1877) is soft, amorphous and of acid reaction, and represents, essentially, the alcoholic extract of the ethereal extract of the root.

Dr. C. B. White, U. S. A., has recorded (see AMER. JOUR. PHAR., 1873, p. 371) a case of poisoning by the root of the *water parsnip*, *Sium latifolium*, now known as Sium cicutæfolium, *Gmelin*, which, like the water-hemlock, is indigenous throughout the North American continent. Analyzed by A. R. Porter and by N. Rogers (*ibid.*, 1876, pp. 348 and 483), no poisonous principle could be detected, and the deleterious effects were ascribed as being possibly due to a resin. Whether this root has, to some extent, been eaten in the place of other umbelliferous roots, will be difficult to determine; in a large number of works on descriptive and medical botany, which I have consulted, no allusion could be found to its supposed poisonous properties, except in Carter's Synopsis of the Medical Botany of the United States.

During the last and in the beginning of the present century Cicuta maculata appears to have been employed medicinally, and references to its properties and uses will be found in the writings of Schoepf, Barton, Muhlenberg, Bigelow and others.

Euphorbia marginata, *Pursh*, a well-known garden plant, commonly called "snow on the mountain," is indigenous to the country between the Rocky Mountains and the Mississippi River, and in the Eastern States is beginning to establish itself. Like other species of the same genus, it contains an acrid milk-juice. Applied to the skin, this juice produces a decided burning sensation and ultimately redness and a pimply eruption, somewhat resembling that occasioned by poison-oak, as has been observed by Mr. J. Schneck, of Mount Carmel, Ill. (see *Botanical Gazette*, 1890, p. 276). As far as examined the acrid principle of the euphorbias is an amorphous resin, and exists in the different species in very unequal proportion, the annual plants being usually mildest in their action. It would be of interest to determine the nature of the irritating principle of the plant in question, likewise the amount of fixed oil obtainable from the seeds, and to what extent this may possess purgative and rubefacient properties, which are commonly observed in oils of the euphorbiaceæ.

Eupatorium purpureum, *Linné*, is known in some localities as

gravel-root and *kidney-root* in allusion to the supposed virtues of its subterraneous parts. Some time ago it was sent to me from Harrisburg, Pa, with the statement that it was said by some parties to be a sovereign cure for rheumatism, and that it was used in the form of tincture prepared by steeping the root in whisky for a week. An analysis of this drug was made by Mr. G. Herbert Ray and published by Prof. Trimble (see AMER. JOUR. PHAR., 1890, p. 74), from which it appears that only 13 to 14 per cent. are taken up by simple solvents, and of this amount fully four-fifths consists of carbohydrates and albuminoids, the remainder being resinous, oily and waxy matters, so that it is difficult to imagine to what principle the alleged medical properties could be due. A compound of undoubted interest, though most likely destitute of decided activity, is Prof. Lloyd's *euparin* (*ibid.*, p. 76), which crystallizes in handsome bright yellow needles, and is apt to be deposited from the fluid extract on standing. A bitter principle which is present to a limited amount in this drug, is prevalent to a larger extent in other species; but the aromatic properties, which are frequently encountered among the 560 known species of Eupatorium, are wanting almost entirely.

Hieracium is another extensive genus, of fully 200 species, of the order Compositæ, to which also Eupatorium belongs. The plants of the former genus are generally more or less bitter and astringent, and like others of similar qualities have occasionally been employed as mild astringents and tonics. Of the North American species, H. venosum, *Linné*, enjoyed considerable repute as an alexipharmic, hence the popular name *rattlesnake weed*, by which it is still known. The case related by Dr. Harlan (*Trans. Am. Phil. Soc.*, new ser., vol. iii) of a person who allowed himself to be bitten by a rattlesnake, and was completely revived after taking some decoction of this plant, is still quoted in medical works on indigenous Materia Medica. Another claimant for similar honors has recently been reported by Mr. F. D. Kelsey, of Helena, Montana (*Botan. Gazette*, 1890, p. 237), upon the testimony of a clergyman, Rev. Mr. Clark, who affirms that he has successfully treated several patients and has never yet lost a case. He employs Hieracium Scouleri, *Hooker*, the fresh plant being bruised, then gently steeped in milk, the liquid strained and drank in large quantities until the patient has fully recovered; he also believes that it can be made into a preparation like an extract.

The plant is described by Coulter (Rocky Mountain Botany, p. 217) as follows: Robust, a foot or two high; *hairs long and soft setose, whitish or yellowish;* leaves lanceolate or spatulate-lanceolate, 3 to 6 inches long; *panicle irregular or branching;* involucre somewhat furfuraceous and glandular, also sparsely or copiously beset with long bristly hairs; *akenes columnar* and short; *pappus whitish* —from Montana to Oregon and south to the Wahsatch.

It may not be without interest to refer in this connection to a species introduced from Europe, Hieracium prælatum, *Villars*, which according to Lester F. Ward (*ibid.*, 1889, p. 10–17), has become such a pest in Jefferson county, New York, that it is now known there as *devil-weed* and *king-devil.*

The common name *fever-root*, by which Triosteum perfoliatum, *Linné*, is known in some localities, indicates the use which is said to have been made of it by the Cherokee Indians. It is a mild cathartic and in the fresh state possesses emetic properties. The drug appears to enjoy considerable popular reputation in various complaints, as may be judged from information received by me from different sections of the country. Lately I have learned that near Dallas, Georgia, it is in local repute as a remedy in rheumatic affections, and that it is cultivated there by a farmer and prescribed in rheumatism with seeming success. The plant grows mostly in woodlands, from Canada to Iowa and southward to Alabama. It deserves a thorough chemical investigation. It has been variously known as *Dr. Tinker's weed, wild ipecac, horse-gentian,* and *wild coffee*, the latter name having reference to the use which has formerly been made of the hard nutlets, three of which are contained in the rather dry drupaceous fruit.

Ceanothus americanus, *Linné*, is perhaps best known in the Atlantic States as *New Jersey tea* in reference to the use sometimes made of the leaves as a substitute for tea. Medical works also speak of the use of root by the Cherokees in gonorrhœa, cancer and syphilis. Until recently I had not learned that it was popularly employed for one of these complaints; some time ago I received information from the central part of Texas that it is used there in a crude manner in gonorrhœa with much success and is designated as clap-root. The drug is astringent, and from a recent investigation made by F. C. Gerlach appears also to contain an alkaloid.

Helianthemum canadense, *Michaux*, is the only plant of the

indigenous cistaceæ which was formerly admitted into the Pharmacopœia, and is still employed to some extent, mainly in scrofulous affections. The closely-allied genus Lechea comprises about eight homely North American herbs growing in sandy soil and sterile localities. They are generally known as *pin-weeds*; but under the name of *flux-weed* a plant was received from a southern town, which proved to be Lechea major, *Michaux*, and which was stated to be used for complaints indicated by the common name. It has an astringent and somewhat bitter taste, and according to Dr. Carter (*loc. cit.*, p. 14) is reputed to be tonic, febrifuge and antiperiodic. Its constituents are unknown, except so far as they are indicated by the sensible properties of the plant.

To the indigenous plants reputed to possess alexipharmic properties another may possibly have to be added, which, however, is not likely to prove very efficient for such purposes. The plant came from North Carolina, and was claimed to have been successfully used for some time in cases of snake bites, poisoning from insects, etc. It was Galium pilosum, *Aiton*, an herbaceous perennial, found in rather dry soil from New England westward to Eastern Kansas and southward to near the Gulf. It has a nearly erect rough stem, oval and punctate leaves in whorls of four, small purplish-brown pedicellate flowers, and a subglobular dry fruit beset with hooked bristles. The few species of Galium which have been subjected to chemical examination have shown the presence of a peculiar kind of tannin, some citric and other organic acids, to which is probably due the effect upon milk, this being curdled by some species. They have generally been regarded as being mildly refrigerant, diuretic and aperient, and more striking effects were, most likely, not observed from the plant in question, since the party sending it desired to learn from me all its medicinal properties.

A species of the same genus was recently the cause of a curious, though innocent, mistake. A German physician in a Western State ordered for use in his practice a quantity of leaves of "Hirschzunge" (*hart's-tongue*). Both, the German name and its English equivalent, are applied to a fern which is still officinal in some pharmacopœias of Europe, Scolopendrium vulgare, *Smith*, and which is indigenous throughout a large part of the Northern Hemisphere. While this fern is rare in the United States, and not often found in drug stores, an entirely different indigenous plant is well known by the similar

English name of *deer's-tongue*, Trilisa (Liatris) odoratissima, *Cassini*, now also called *vanilla plant*, on account of its fragrant odor, due to coumarin. This species grows only in the Southern States, and from the experience in the present case, appears to be replaced in some localities, probably for use as a tobacco flavor, by another more common plant, which also contains coumarin; for the article supplied as *Hirschzunge*, was Galium triflorum, *Michaux*, the so-called *sweet-scented bedstraw*, which is indigenous throughout North America. The package having been labelled deer's-tongue leaves, it seems that this name is now, in some localities at least, given to the substitute for that plant for which it was formerly exclusively used. In this connection it may be mentioned that the same species of Galium is collected by German inhabitants as *Waldmeister*, and used in the preparation of "may-wine," in place of, and as a substitute for, the closely allied Asperula odorata, *Linné*, which does not grow in the United States.

Tillandsia usneoides, *Linné*, known in our Southern States as *long*, *black*, or *Spanish moss*, has been found very useful by Dr. L. M. Tiffany, of Baltimore (*Med. News*, Dcbr., 1890), as a soft and elastic dressing for wounds. This so-called moss is botanically related to the pineapple, and is classed with the order of Bromeliaceæ. It is a true epiphyte, and is met with only in humid situations where it hangs in long tufts from the branches of trees. After it has been deprived of the softer portions of the tissue, the nearly black fibres are used for upholstering, and are now recommended as stated. The living plant is of a grayish-green color.

CICUTA MACULATA, *LINNE.*

By Robert Glenk, Ph.G.

From an Inaugural Essay presented to the Philadelphia College of Pharmacy.

This species is popularly known as water hemlock, musquash root, beaver poison, or spotted cowbane, and grows on the borders of swamps and on the banks of streams, flowering during July and August. After fruiting, the stem dies off to the ground, but a bud survives, and from this the shoots of the following spring appear. The flowers grow in umbels of 2 to 4 inches in diameter, without a general involucre. Calyx consists of 5 minute sepals adhering to the 2-celled and 2-ovuled ovary; the 5 inflected white petals alternate with the 5 stamens and are inserted on the disk which crowns

the ovary and surrounds the base of the 2 diverging styles. The fruit is a sub-globular cremocarp, about $\frac{1}{12}$ in. long, contracted or compressed on the side, each mericarp having 5 strong ribs and 6 single oil tubes, two of which are on the face. The seed is suspended from the top of the cell, and consists of a minute embryo, surrounded by albumen. The stem is smooth, branched at the top, hollow, jointed, usually of a striated purplish green color, except when growing in the shade, when it is green. The leaves are alternate, pinnately compound; the leaflets oblong-lanceolate, coarsely serrate, the veins ending in the notches, and not in the points of the serratures. The petioles are hollow and sheathing at base. The root is composed of from 2 to 7 large, fleshy branches, frequently 3–4 in. long and 1 inch in thickness. In various parts of the root bark are found cavities or cells, containing a yellowish, resinous juice. It has a strong, parsley-like odor and taste.

Microscopical Structure.—The root has a corky layer consisting of about 3 rows of flattened cells. The thick bark consists mostly of parenchyma tissue,with large intercellular spaces and numerous large resin cells. Under the thin cambium zone is the meditullium, with broad medullary rays and without wood fibres, but in the centre with a layer of large ducts. The hollow stem is made up of a cylinder of wood, enclosed by a thin cortical layer. The wood wedges are slender, of the same size as the medullary rays, and surround a few circles of parenchyma of a white color, the remnants of the pith. The hollow petiole has a structure analogous to that of the stem. The epidermis of the upper side of the leaflets consist of one row of cells; the palisade layer is in one or more rows of vertically elongated cells; the parenchyma, between this layer and the lower surface, encloses irregular air spaces. On the lower surface are numerous scattered stomata. The leaves are free from hairs on the surface. The tissue of the albumen of the seed is composed of parenchyma, containing colorless drops of fixed oil, also transparent colorless spherical grains, several of which are enclosed in each cell. Under a high magnifying power they show a series of concentric layers; they are colored brown by iodine. The vittæ are filled with a yellowish-brown essential oil, and extend the whole length of the fruit.

Chemical Investigation of the Fruit.—The fruit was gathered during August, September and October, before the dark green color

had been lost, it giving then a stronger odor with solution of potassa, than in the fully ripened condition.

Following out a plan of analysis, similar to Dragendorff's, the following proximate constituents were noted:

The fruit, owing to its oily nature, was first macerated in the bruised condition with petroleum spirit, of a boiling point 40° C., for 3 days; this first extract was then poured off and reserved. The residue was finely powdered and again extracted with petroleum ether until nothing further was dissolved out. On evaporation a residue was left, equal to 21·2 per cent. of the fruit, of which 5·1 per cent. is volatile oil. The fatty oil is semi-solid at ordinary temperatures, and of a green color, owing to the presence of a little dissolved chlorophyll. It belongs to the class of non-drying oils, and forms, with HNO_2, a soft, brownish solid. On decolorizing its solution in ether by animal charcoal, a light, yellowish oil is produced, having the sp. grav. 0·946; with H_2SO_4 conc. (1 acid, 5 oil), colored dark brown; soluble in all proportions in absolute alcohol, ether, chloroform, bisulphide of carbon, and in 100 parts of acetic ether; insoluble in glacial acetic acid.

The volatile oil obtained by distilling the bruised fruit with water was first of a dark color, but on re-distillation was obtained nearly colorless; yield 4·8 per cent.; sp. grav. ·855; boiling point 177° C. (350° F.); soluble in 1½ parts of commercial alcohol, in all proportions of absolute alcohol and in 50 parts of glacial acetic acid. The following color reactions were observed: a solution of bromine in chloroform (1-20) gives a brownish color; a strong alcoholic solution of HCl colors a reddish violet; H_2SO_4 conc. (6 drops to 1 of oil) immediately dark brown; fuming HNO_3 on a solution of the oil in bisulphide of carbon gives a brownish tint; solid iodine added to the oil dissolves slowly; picric acid on warming dissolves with an orange color.

The *ether extract* weighed 2·12 per cent. of which ·98 per cent. was resin soluble in alcohol. This, on incineration, left ·5 per cent. of ash; it gives with H_2SO_4 a brown color, with conc. HNO_3 a light brown solution; with 5 per cent. KOH a yellow solution and this with potassium permanganate becomes an emerald green, purplish, then reddish brown.

The *absolute alcohol extract* weighed 2 per cent. of which ·68 per cent. was resin and 1·32 per cent. soluble in water. The watery

solution gave with ferric chloride a brownish green color, with lead acetate no precipitate; with KOH a decided coniine-like odor; and after acidulation with HCl, a precipitate with potassio-mercuric iodide. After the preparation of the volatile oil from the drug, the residue in the retort was mixed with milk of lime and distilled. The distillate had a strong coniine-like odor. On agitation with petroleum ether and evaporating the solvent, a syrupy strong smelling liquid was left, which turned darker on standing in a beaker for 24 hours. The alkaloid forms heavy white fumes on bringing a rod moistened with HCl in contact with the vapor. On the addition of conc. H_2SO_4 a reddish color is produced.

The aqueous solution reduces mercuric chloride and silver nitrate. Neutral acetate of lead produces a white precipitate; ammoniacal copper sulphate bluish white; platinic chloride yellowish red; potassio-mercuric iodide grayish white; gold chloride yellowish white; tannin or picric acid give no precipitates with the aqueous solution, and ferric chloride is merely darkened in color. Whether this alkaloid is identical with coniine could not be fully determined, owing to scarcity of material. It does not seem to be present in the root.

The results on treating the fruit with other solvents, are given in the tabular statement below.

On drying at 110° C. the loss of the fruit was 10 per cent.; the ash amounting to 6 per cent. contained:

	Per Cent.
CaO,	14·9
Al_2O_3,	20·0
MgO,	29·3
H_2SO_4,	15·2
Cl,	14·5

Smaller quantities of K,Na, SiO_2, Fe_2O_3 and CO_2; phosphoric acid could not be detected.

RECAPITULATION.

		Per Cent.
Moisture,		10·00
Ash,		6·00
Petroleum Ether Extract:	Volatile oil,	5·10
	Fixed oil and chlorophyll,	16·10
Ether Extract:	Resin sol. in alcohol,	·98
	Resin sol. in ether, chlorophyll,	1·14
Absolute Alcohol Extract:	Resin,	·68
	Extractive, etc., sol. in water, alkaloid,	1·32

RECAPITULATION.—(*Continued.*)

		Per Cent.
Aqueous Extract:	Mucilage etc.,	12·90
	Glucose,	6·00
	Malic acid, etc.,	2·70
	Ash,	4·00
Dilute Soda: Pectin and albuminoids,		3·20
1 per cent. Hydrochloric acid: Inorganic matter,		2·00
Chlorine water: Lignin, etc.,		6·00
$KClO_3$ and HNO_3: Incrusting matter,		4·00
Residue: Cellulose, etc.,		17·00
Loss,		·88
		100·00

CEANOTHUS.

By Frank C. Gerlach, Ph.G.

Contribution from the Chemical Laboratory of the Philadelphia College of Pharmacy, No. 89.

The root bark of *Ceanothus americanus*, Linné, Natural Order Rhamnaceæ.

This is a shrubby plant indigenous to the greater part of North America, growing in pine barrens and dry woodlands. It attains a height of about three feet and has alternate, ovate or oblong-ovate, serrate leaves, which are sometimes heart-shaped at the base, downy underneath and three-veined. The small white flowers are in axillary panicles, and produce three-lobed capsules containing three seeds. The root is a foot or more in length, nearly cylindrical and from one-half to one inch in thickness, with a knotty head and a few branches, and covered with a firmly adhering rust-colored bark, which is about one-twelfth inch thick, with some longitudinal ridges. This bark is hard, breaks with a short granular fracture, and when cut with a knife has a brown-red and waxy appearance. The wood is very tough, of a light red-brown color and of a waxy lustre upon the recently cut surface. The root-branches have a light colored bark and a whitish wood. The root is without odor, and has a bitter astringent taste, which is strongest in the bark. The leaves of this plant were used during the Revolutionary War as a substitute for tea, and in the late Civil War it was employed in the same manner and pronounced a good substitute for indifferent tea.

The root is astringent and was applied locally by the Cherokee

Indians in gonorrhœa and cancer, and given internally in syphilis. A decoction of the leaves and seeds has been used in ulceration of the mouth and throat, and internally in dysentery. All of these properties are due, no doubt, to the tannin.

The following are the results of a proximate analysis. The moisture by drying to constant weight at 110° C. was found to be 10·08 per cent., and the ash obtained by careful ignition amounted to 8·44 per cent., no unusual constituents were found in the latter.

Soluble in water,	9·48 per cent.
Soluble in hydrochloric acid,	53·32 "
Insoluble,	37·20 "
	100·00 "

Petroleum ether extracted from the finely-powdered drug, 0·20 per cent. The extract was of a dark green color, of a slightly aromatic odor and consisted of fixed oil, which was semi-solid at ordinary temperatures, vegetable wax and a trace of volatile oil.

The residual drug yielded 1·01 per cent. to stronger ether, consisting entirely of resin.

Absolute alcohol extracted from the remaining drug, 6·02 per cent., consisting of tannin, which was determined in another portion, of gallic acid 0·20 per cent., glucose 1·80 per cent., red coloring matter 1·00 per cent., for which the name *ceanothus red* is suggested. The total alcoholic extract was dissolved in a small quantity of alcohol, poured into acidulated water, filtered and the filtrate agitated successively with petroleum ether, ether and chloroform, none of which extracted anything. The liquid after removal of all chloroform was rendered alkaline and again agitated with the above solvents; of these stronger ether extracted 0·2 to 0·3 per cent. of a substance which gave characteristic tests with several alkaloidal reagents. This substance will be considered later.

Water extracted from the remaining drug 7·52 per cent., consisting of mucilage 5·00 per cent., glucose 1·95 per cent., saccharose 0·35 per cent. and tannin 0·21 per cent.

After treatment with water, 4·00 per cent. were extracted by dilute sodium hydrate solution, which consisted almost entirely of albuminoids.

Dilute hydrochloric acid, extracted 2·40 per cent., consisting of calcium oxalate, 0·52 per cent., and 1·87 per cent. of starch, obtained by a special estimation.

Chlorine water extracted 20·30 per cent. of lignin; potassium chlorate and nitric acid extracted 5·96 per cent. of intercellular matter, and there remained 29·88 per cent. of cellulose.

SPECIAL ESTIMATION OF TANNIN.

Ten grams of the drug were exhausted with hot water, and the resulting infusion precipitated with gelatin and alum. The precipitate was washed, dried, weighed, and 54 per cent. calculated as tannin, which indicated it to be present in the drug to the extent of 6·48 per cent. This tannin belonged to that class which precipitates iron salts green.

SPECIAL EXTRACTION OF ALKALOID.

After trying several processes, seven kilos of the drug were exhausted with water acidulated with acetic acid. One-half of the percolate was evaporated to small bulk, rendered alkaline, and agitated with a mixture composed of six parts of ether and one part of chloroform. This mixture was found to most readily extract the alkaloid. On evaporating the ether-chloroform 0·37 per cent. of residue was obtained in white masses.

In the other portion of the percolate the agitation was made without evaporation, and the yield of alkaloid was 0·52 per cent. For this alkaloid the name *Ceanothine* is suggested. It was readily soluble in chloroform, separating, on evaporation, in granular crystals, fusing at about 190° C. It was less soluble in ether, alcohol and carbon disulphide. The taste was a distinct bitter. Ceanothine resembles caffeine, in not forming salts, as in an acidulated solution, evaporated in a vacuum over sulphuric acid, the acid separated from the alkaloid leaving the latter in transparent scales, and, after long contact, turning red. It also differed from caffeine in being precipitated by Mayer's reagent. This alkaloid, when heated with soda-lime, readily liberated ammonia. When heated on platinum foil it burned without residue. It reduced metallic gold from solution of gold chloride, and gave characteristic white precipitates with Mayer's reagent, platinic chloride, phosphomolybdic acid and tannin, also red precipitates with potassium tri-iodide, cadmium iodide and bismuth iodide. When applied to the dry substance, concentrated sulphuric acid gave a reddish-brown color, nitric acid a yellow, and Fröhde's reagent a blue.

SABBATIA ANGULARIS.

By William T. Hankey, Ph.G.

Contribution from the Chemical Laboratory of the Philadelphia College of Pharmacy.—No. 90.

The American Centaury is a smooth biennial herb, indigenous to the Middle and Southern United States. Its stem is about two feet high, quadrangular, winged and much branched above; the leaves are about one inch long, oblong-ovate, five-nerved, entire, acute and at the base clasping. The flowers are in terminal corymbose panicles, having a five or six-parted calyx with lance-linear lobes, a wheel-shaped, pale or purplish-red corolla about one and one-half inches in diameter. The stamens number from five to twelve and are finally recurved. The capsule is oblong ovate, mucronate and many seeded. The plant blooms in July and should then be collected. In the dry state the drug is without odor, but has a persistent and purely bitter taste. It is employed mainly in domestic practice as a simple tonic.

An analysis of Sabbatia angularis was made in 1871 by J. F. Huneker, who announced the presence of a neutral principle—Erythrocentaurin—but did not succeed in isolating the bitter principle.

With this in view I first submitted fifty grams of the finely powdered drug to proximate analysis with the following results:

Solvents used.	Substances obtained.	Per Cent.	
Petroleum ether,	Volatile oil,	·01	
	Fat,	·91	
	Wax,	·70	
	Caoutchouc,	·37	
			1·99
Stronger ether,	Greenish Resin,	·72	
	Erythrocentaurin,	·05	
	Undetermined,	·12	
			·89
Absolute alcohol,	Bitter principle,	3·75	
	Greenish resin,	·62	
	Glucose,	·43	
	Extractive,	1·57	6·37
Distilled water,	Mucilage,	2·16	
	Dextrin,	1·13	
	Glucose,	1·25	
	Saccharose,	·88	
	Undetermined,	5·56	
			10·98

Solvents used.	Substances obtained.		Per Cent.
Dilute soda solution,	Pectin and albuminoids,		6·06
Dilute hydrochloric acid,	Pararabin,	1·20	
	Extractive,	2·98	
			4·18
Chlorine water,			7·40
Nitric acid and potassium chlorate,			13·90
	Cellulose,		36·50
	Ash, soluble in water,	1·17	
	Soluble in HCl,	1·30	
	Insoluble,	·38	
			2·85
	Moisture,		8·05
	Loss,		·83
Total,			100·00

With a view of confirming the previous analysis and trying to isolate the bitter principle, two hundred grams of the powdered drug were percolated with five hundred cubic centimeters of petroleum ether, to remove fat, wax, etc. The drug was then dried and percolated with eight hundred cubic centimeters of stronger ether, again dried and percolated with 95 per cent. alcohol until exhausted of bitter principle.

Ethereal Percolate.—After recovering ether the residue was dissolved in a small quantity of absolute alcohol, and poured into water containing one per cent. of hydrochloric acid, the greenish resin so precipitated removed by filtration and the filtrate agitated with chloroform, which apparently exhausted it. The chloroform was separated and allowed to evaporate spontaneously, leaving a quantity of resinous matter; this was washed with stronger ether, which, on spontaneous evaporation, left a minute quantity of a substance, crystalline in character, reddish-yellow in color, of a sharp acid taste, and having a strong and pungent odor, resembling that of nicotine. It was soluble in water, alcohol and ether, and gave negative results towards alkaloidal reagents. A small quantity dissolved in water acidulated with hydrochloric acid and placed in a water-bath at 60° C. for one hour, and then made alkaline with sodium hydrate failed to reduce Fehling's solution, indicating its non-glucosidal character. It undoubtedly was the principle isolated by Huneker in 1871, and called by him erythrocentaurin.

Alcoholic Percolate.—After recovering the solvent from this percolate, a considerable amount of a soft and very bitter extract was

obtained, which resembled in color, odor, taste and behavior with ferric chloride, the extract obtained from Gentiana lutea. This was washed with water, which took out the bitter principle, leaving a soft oily resin. The aqueous portion of the alcoholic extract containing the bitter principle was characterized by its property of foaming, which was probably due to the presence of a small quantity of saponin. The solution behaved similarly to gentian towards ferric chloride. This coloration was not due to tannin, as no precipitate could be obtained with solution of gelatin and alum, and the coloration was also produced by the portion soluble in chloroform. It was agitated successively with chloroform, ether, benzol and amyl alcohol without anything being extracted by them that possessed a bitter taste. The solution was then rendered alkaline and again agitated with the above solvents with similar negative result.

Tannic acid failed to precipitate anything from a small portion. The above treatment left the bitter solution of a transparent ruby-red color. It was divided into two equal portions. One portion treated with animal charcoal, the latter removed and boiled with 95 per cent. alcohol, the alcohol filtered off and allowed to evaporate spontaneously, left a bitter amorphous, transparent extract of a reddish-yellow color, quite hygroscopic and very soluble in water, soluble in 95 per cent. alcohol and partly soluble in absolute alcohol. Several attempts were made to get it in a crystalline condition, but without success. The other portion of the bitter solution was evaporated on a water-bath to a soft extract, then dissolved in alcohol, filtered and the alcohol allowed to evaporate, leaving an extract similar to that obtained by the use of animal charcoal. All attempts to obtain this bitter substance in a crystalline condition failed. When heated with Fehling's solution it exerted a slight reducing action, but after heating with one per cent. hydrochloric acid for an hour, making alkaline and then heating with Fehling's solution, it reduced the latter abundantly. This, along with the peculiar odor produced by heating it with dilute acid, demonstrated it to be a glucoside, which, on account of the ease with which it decomposed, could not be obtained in a crystalline state. As obtained, however, from absolute alcohol, it was, no doubt, nearly pure, contaminated only with the products of its own decomposition. In addition to the properties mentioned in the description of its preparation,

it may be stated that it was changed to a ruby-red color by sulphuric acid and to a dark green by ferric chloride. Its aqueous solution, which was of a citrine yellow color, assumed a much deeper color on the addition of sodium hydrate.

CHEMICAL NOTES.

By Henry C. C. Maisch, Ph.G., Ph.D.

Aconitum and Aconitine.—E. Richards and Ashley Roger (*Chem. and Druggist*, 1891, **38**, p. 205, 242) in examinations of Aconitum, arrived at the following conclusions: (I) The best material for the preparation of aconitine is the tubers of Aconitum Napellus. (II) The alkaloid is found in the cambium, the vascular bundles and sieve ducts. (III) The crystals of aconitine represent hexagonal thin plates with acute ends. (IV) It is probable that two varieties, α and β, of aconitine exist. Melting point of α-aconitine = 182–184° C., β-aconitine 178–180° C.; the latter is also about six times as poisonous as the former. (V) Formula for aconitine is $C_{33}H_{43}N_2O_{12}$. (VI) Percentage of alkaloid in fresh tuber 0·71 per cent., dry 0·14 per cent., Japanese aconite dry 0·57 per cent.

The method for the preparation of aconitine, recommended by the above authors, is as follows: (*a*) The powdered tuber is macerated from three to four days, with washed fusel oil, then percolated and the alkaloid extracted from the percolate with small quantities of dilute sulphuric acid. (*b*) The fusel oil is removed from this solution by treatment with ether and the dissolved ether driven off by heat. (*c*) The alkaloid is precipitated from the acid solution by solution of sodium carbonate, collected on a strainer pressed between limestones and then spread on bibulous paper and allowed to dry at ordinary temperature. (*d*) The dried alkaloid is then boiled with pure dry ether and the filtrate set aside to crystallize; the crystals are then redissolved in a small quantity of ether to remove a gum-like body. (*e*) The toxic properties of aconitine as thus obtained is rather great, but can be improved by conversion into the nitrate, and then from this obtaining the alkaloid.

New Alkaloids from Cevadilla seeds.—E. Merck (*Berichte*, Jan., 1891, through *Chem. Ztg., Rep.*, 1891, p. 48) has isolated two new alkaloids from cevadilla, which he has named sabadine and sabadinine, and for which the following is characteristic. They remain dissolved when isolated by alkalis, carbonates and ammonia, but

are precipitated on boiling the solution. *Sabadine* crystallizes from ether in short needles, and in the crystalline state is difficultly soluble in water and ether. The fusing point is 238–240° C., where decomposition takes place. On complete evaporation of the etheral solution the last portions remain as an amorphous mass, which gradually crystallizes. Concentrated sulphuric acid dissolves the alkaloid with a yellow color and a green fluorescence; this disappears as the liquid assumes a blood-red and then violet color. Sabadine is not sternutatory, and has the formula $C_{29}H_{51}NO_8$. *Sabadinine* crystallizes from ether in filiform needles, somewhat soluble in water and rather soluble in alcohol. At a higher temperature, decomposition takes place. Concentrated sulphuric acid dissolves the alkaloid with an unchangeable blood-red color. Sabadinine is not sternutatory, and possesses the formula $C_{27}H_{43}NO_8$ or $C_{27}H_{45}NO_8$.

A new Alkaloid from Conium maculatum.—E. Merck (l. c., through Chem. Centrbl., 91, I, 414) obtained a small quantity of a new alkaloid from the high boiling portion of crude coniine. The isolation was accomplished by fractional distillation in vacuo and recrystallization. The alkaloid crystallizes in needles, is easily soluble in alcohol, ether and chloroform, fuses at about 98° C., and boils at 230–232° C. According to Ladenburg, the alkaloid is an isomere of conhydrine, having the formula $C_8H_{17}NO$, and for this reason the name *pseudo-conhydrine* was selected.

Muawine.—E. Merck (l. c.) isolated this alkaloid from the bark of the Muawi tree (not determined). The bark possesses toxic properties similar to those of sassy bark (Erythrophlœum guineense), only acting stronger and quicker. The alkaloid is thick, syrupy, easily soluble in alcohol, ether and chloroform, and resembles erythrophlœine. The salts do not crystallize, the bromhydrate forming a white powder easily soluble in water, alcohol and chloroform. According to Kobert the physiological action is similar to, but not identical with, that of erythrophlœine.

Reactions of Cocaine and Ecgonine.—D. Vitali (*L'Orosi*, **14**, 1–19) proposes the following test for cocaine. A trace of cocoaine is placed in a porcelain capsule, ½–1 cc. of sulphuric acid added, and solution of the alkaloid effected. To this is added iodate of potassium, or sodium, or iodic acid in quantity equal to three times that of cocaine. If this mixture is slightly heated on a water-bath,

light green stripes appear; by continuing the heating the liquid becomes grass-green and then dark blue. On increasing the heat the liquid assumes a violet color, and violet vapors are given off. The reaction is said to be very delicate, as still 0·00005 gm. can be recognized. Other alkaloids show similar reactions with this reagent, which differ, however, in some respects from that shown by cocaine. Ecgonine does not show this reaction, which seems to be due to the benzoyl group, as benzoic acid is thus affected with the same intensity as cocaine. The difference between the alkaloids is shown by the following: Cocaine is dissolved in 2 cc. concentrated sulphuric acid, and to this added drop by drop an acid (H_2SO_4) solution of potassium permanganate, when a violet color appears, the solution on stirring becoming colorless Ecgonine treated in like manner gives with the first drop a yellow color, and when more is added a violet color, which is more stable than that obtained with cocaine. Iodopotassium iodide gives with cocaine round black globules, while with ecgonine it causes a yellowish-red precipitate gradually crystallizing. This investigation was carried on with the ultimate intention of finding how cocaine behaves in the body. From the reactions with urine of a person who had taken cocaine inwardly it seems as if cocaine is fully decomposed in the human body, at least the urine did not even give the reactions for ecgonine.

On the principal Constituent of the Oil of Mentha Pulegium, Linné.—M. Pleissner (Annalen **262**, 1–37) obtained by distilling in vacuum an oil of boiling point 130–131° C. at 60 mm. pressure. It is colorless, specific gravity 0·9323 at 20° C; $[\alpha]_D = + 22·89°$. The compound has the formula $C_{10}H_{16}O$ is isomeric with camphor, but differs in being a ketone, wherefore it was named *pulegone*. Among the bodies derived from this we have the monoxime, differing from camphoroxime in containing H_2O, which remains constant in all derivatives. By reducing the oxime the pulegonamine was obtained. Sodium in ether converts pulegone into left menthol, which was identified by the benzoate.

Volatile oil of Asafœtida.—F. W. Semmler (*Ber. d. D. Chem. Ges.*, 1891, 78) found in the above (1), two terpenes; (2) an oxygenated body $(C_{10}H_{16}O)_n$ yielding a sesquiterpene $C_{15}H_{24}$, on treatment with sodium; (3) the disulphides $C_7H_{14}S_2$, and (4) $C_{11}H_{20}S_2$. With zinc

dust these yield the respective monosulphides. Allyl sulphide is not present in the oil of asafœtida.

Olefinic Constituents of Ethereal Oils.—F. W. Semmler (*Ber. d. D. Chem. Ges.*, 1891, 201), describes the following: (1) *Geranial* (Geramium aldehyde) $C_{10}H_{16}O$ is a light yellow fluid, which is obtained colorless by distillation in vacuo, and possesses an odor of lemon and orange. It boils at 224–228° C. at 760 mm. and 110–112° C. at 12 mm. pressure; its specific gravity is 0·8992, and it has no action on polarized light. (2) *Oil of orange peel* contains geranial, and a lower boiling aldehyde. (3) *Citral*, a body isolated by Schimmel & Co., from oil of lemon, lemon grass and citronella is identical with geranial. (4) Geranial boiled with double the amount of bisulphate of potassium yields cymol. (5) *Oil of Coriander* distilled in vacuo yielded terpenes and coriandrol $C_{10}H_{18}O$, boiling at 194–198° C. at 760 mm. with partial decomposition, and at 85–90° C. at 20 mm. pressure. It is dextrorotary, and takes up four bromine atoms. (6) *Linaloe-oil* (Licaria guianensis, *Aublet*, Lauraceæ) contains linalool $C_{10}H_{18}O$, having the specific gravity 0·8702 at 20° C., and is lævogyre. (7) Oil of melissa (German) contains an aldehyde, probably identical with citronellol of Dodge (A. J. P., 1890, 13, 355). (8) As olefinic camphors the author regards bodies having the formulas $C_{10}H_{20}O$, $C_{10}H_{18}O$ and $C_{10}H_{16}O$, which are not benzol derivatives. These bodies as far as known are liquid, have a lower specific gravity and a higher refractive power than the aromatic camphors. They are either alcohols, aldehydes or ketones.

Ol. Ricini—According to H. Meyer (*Arch. f. exper. Pathol.*, 28, 145), the purging action of castor oil is due to ricinolic acid and its glyceride. Besides these two bodies the ricinelaidic acid was also experimented with. All three produced purging with cats.

PHARMACEUTICAL USES OF EXTRACT OF MALT.

By Jean Gordon, Ph. G.

From an Inaugural Essay presented to the Philadelphia College of Pharmacy.

Although the use of extract of malt as an emulsifying agent and as a vehicle for various remedies is frequently mentioned in journals and pharmaceutical works, and manufacturing chemists have put upon the market a very large number of mixtures or emulsions of malt extract with cod liver oil, some of them so prepared as to be quite agreeable to the taste; yet I am not aware

that the dispensing pharmacist has availed himself to any extent of its advantages in preparing mixtures when insoluble substances are to be suspended. I was first led to experiment with it on being asked by a physician to prepare an emulsion of *naphthalin* and to make it as pleasant as possible. The slight solubility of naphthalin in water renders most of its mixtures very unpleasant, and after trying many experiments it occurred to me that extract of malt might be used, it not seeming to possess sufficient medicinal activity to cause its use to be objectionable in the very small proportion necessary to form a good mixture. After rubbing the naphthalin in a mortar to a very fine powder, a definite quantity of malt extract is then added gradually and triturated until a perfectly smooth mixture is obtained. The substance is now suspended, but the mixture is too thick to pour well from a bottle; it is then diluted by the addition of an equal volume of syrup of wild cherry, which not only renders the mixture fluid enough to pour out easily, but also imparts to it an agreeable flavor. The higher specific gravity of the malt extract causes the particles of the naphthalin to remain suspended, and its viscidity, even when diluted one-half, is sufficient to prevent it from floating on the top until after standing for some time, when slight agitation will restore a uniform mixture. In an emulsion of naphthalin with mucilage of acacia a very large proportion of acacia must be used, and after standing for a few hours the naphthalin will be seen at the bottom of the bottle, and it is only after the most vigorous shaking that a smooth mixture can be restored if at all—it being very difficult to dislodge the sediment. Compressed tablets of naphthalin are prepared, but on account of its bulkiness, and the large dose sometimes used, it is not a substance exactly suited to that form of administration, if by any means a preparation can be obtained that will to some degree mask the strong odor and taste.

In extract of malt it seems to be less soluble than in syrup, or mucilage of acacia; the mixture just described having scarcely any of the odor and even less of the taste of naphthalin unless held on the tongue until it has been partly dissolved by the fluids of the mouth. It was not the purpose of the physician to administer a medicinal dose of malt, hence only a sufficient quantity was used to make a satisfactory preparation—five grains of finely powdered naphthalin being contained in one fluid drachm.

Some of the resinous substances most frequently administered in form of emulsion yield with extract of malt mixtures equal in all cases to the acacia emulsions, and, in most instances, more agreeable to the taste, and of more attractive appearance. The unsightly appearance of both the tincture and resin of guaiac when made into an emulsion with acacia is well known to every pharmacist, and as it is a remedy which is frequently prescribed, it would seem to be worth making an effort to improve upon the old emulsion. With the *Tincture of Guaiac* a good mixture can be made by stirring together, in a graduate, equal measures of extract of malt and afterwards tincture of guaiac, gradually added; care must be taken not to allow the tincture to come in direct contact with the sides of the graduate and it is well to take the precaution to first wet the sides with the extract and the syrup before the addition of the tincture. The mixture obtained in this way, while not as bright in appearance as either the malt extract or the syrup, does not assume the bluish color of the gum emulsion. After standing for a day it separates into two layers, the lower transparent and bright, the upper one having a slightly curdled appearance, but a slight shake of the bottle suffices to cause the layers to mix again. That the guaiac is contained in both layers I have determined by setting aside a portion in a narrow tube until the two layers had formed and examining them both; the lower one becomes opaque by the addition of water, but glass tubes or graduates containing it can be made perfectly clear and bright by simply rinsing with cold water, thus showing that the resin has been taken up or emulsionized by the extract of malt.

With the *Resin of Guaiac* the method must be slightly different, it should be first rubbed thoroughly in a mortar with the extract of malt until a smooth paste is obtained, after which sufficient of the syrup of wild cherry is added to make the mixture fluid enough.

With *Tincture of Asafetida* a mixture is obtained in the same manner as with tincture of guaiac, but to prepare a mixture from the gum resin, it is best to rub it first in a mortar with a small quantity of hot water to form a paste, then add the malt and syrup alternately in small portions; it can easily be made to contain 8 per cent. —double the strength of the U. S. P. Mistura Asafœtidæ. An advantage of this over the official mixture is, that it does not have the exceedingly disagreeable smell of the latter and the taste is less

unpleasant. Like the mixtures mentioned before the addition of water renders it opaque.

For the administration of the tincture and fluid extract of *Cannabis Indica*, malt extract answers very well; with these preparations the best result is obtained with the following proportions:

Tincturæ Cannabis Indicæ,	℥ss
Extracti Malti,	ʒj
Syrupi Pruni Virginianæ,	℥ss

With *Copaiva* it is necessary to proceed much the same as in making an ordinary emulsion, starting with a small portion of the extract of malt in a mortar and adding with trituration alternately portions of copaiva, malt and syrup. The mixture retains about the color of the malt, forms two layers on standing, but is easily restored by agitation.

With other resinous tinctures and fluid extracts the results have been similar to those described, the ones selected for mention being those we are called upon most frequently to dispense—and are also typical resinous substances. Extract of malt as prepared by the official process, or as found in the market prepared by the various manufacturers, is in itself too thick to dispense as a vehicle, hence it is necessary to use a diluent of some kind. I have selected the syrup of wild cherry for the purpose, because of its agreeable taste and slight odor of hydrocyanic acid. With extract of malt made according to the direction of the Pharmacopœia, results were obtained identical with those from the commercial extracts; about the only difference noticed was in the color of the mixtures, some of the commercial extracts being of a darker color.

In summing up the result of my work in this direction it may be said that in extract of malt we have a ready, inexpensive and equally good substitute for Acacia in suspending and masking the taste of disagreeable, resinous and other insoluble substances, wherever its presence in small quantity is not found to interfere with the therapeutic action of the substance prescribed.

GLEANINGS FROM THE GERMAN JOURNALS.

By Frank X. Moerk, Ph.G.

Elixir of Liquorice.—300·0 extract of liquorice are dissolved in 900·0 fennel water, and 50·0 water of ammonia added; the mixture in a well-stopped bottle is agitated frequently during several days

and then a solution of 10·0 oil of anise in 240·0 alcohol added. After standing the clear portion is decanted, the turbid residue filtered.—Dietel, *Pharm. Ztg.*, 1891, 322.

Ethylene Bromide, which has so frequently been substituted for ethyl bromide, is being recommended and introduced by Dr. Donath (*Wiener Med. Bl.*, 1891, 279) as a remedy for epilepsy; it is given in doses of 0·1 to 0·3 gram three times a day. The forms in which it should be administered, owing to insolubility in water, are emulsions; or alcoholic solution largely diluted with milk before taking; or in gelatin capsules with oil of sweet almonds. The remedy, in physical properties, odor and taste, resembles chloroform; sp. gr. 2·163 at 21° C.; boiling point 131° C.; it contains 90 per cent. bromine and is insoluble in water, but soluble in alcohol and fixed oils.—*Pharm. Ztg.*, 1891, 322.

Salicyl-bromanilide is a combination introduced by Radlauer which is said to contain bromacetanilide and salicylanilide and to unite the desirable properties of acetanilide, bromine and salicylic acid. It is a white powder with an unpleasant, somewhat acidulous taste, sparingly soluble in cold water, easily soluble in boiling water, alcohol and ether; the dose varies from 0·2–0·6 gm.; it is used as an antinervine and reliable antipyretic. Salbromanilide is a term that has been given to this compound for the sake of *brevity*.—*Pharm. Ztg.*, 1891, 323.

Iodophenine, a new iodine derivative of phenacetine, is obtained by adding solution of iodine in potassium iodide to a hydrochloric acid solution of phenacetine. It is made upon a large scale by dissolving 600 gm. phenacetine in 5 kgm. glacial acetic acid, adding a solution of 900 gm. hydrochloric acid in 3 kgm. water and, lastly, a solution of 680 gm. iodine in 1,360 gm. potassium iodide and 1,360 gm. water; if the phenacetine solution be used warm, upon cooling the new compound separates in crystals closely resembling potassium permanganate. Iodophenine possesses a faint iodine-like odor, has a burning taste and colors the skin yellow; it is soluble in glacial acetic acid and in alcohol; insoluble or nearly so in water, in benzol, chloroform and 50 per cent. acetic acid. The iodine is very easily liberated, heating alone or boiling with water accomplishing this; it contains 51 per cent. iodine and has given encouraging results as an antiseptic and a febrifuge.—Dr. L. Scholvien, *Pharm. Centralhalle*, 1891, 311.

Test papers.—E. Dieterich made a series of test papers by impregnating filtering paper with solutions (1 : 250) of the following salts: *Potassium ferrocyanide*, this will indicate one part ferric chloride in 25,000 parts of water and one part copper sulphate in 2,000 parts of water; *Potassium ferri-cyanide* which will indicate one part of ferrous sulphate in 40,000 parts of water; *Potassium sulphocyanate* will react with ferric chloride 1 : 5,000; *Potassium iodide* will indicate lead acetate 1 : 500, bismuth nitrate 1 : 7,000 and silver nitrate 1 : 1,000; *Potassium chromate* will serve to detect lead acetate 1 : 2,000 and silver nitrate 1 : 3,000; *Zinc sulphide* (made by coating filtering paper with freshly precipitated and thoroughly washed zinc sulphide suspended in water), this will react with solutions containing copper sulphate 1 : 15,000, lead acetate 1 : 15,000, bismuth nitrate 1 : 7,000, silver nitrate 1 : 8,000 and mercuric chloride 1 : 1,200. *Starch paper* can be made to indicate one part iodine in 25,000 parts water; *potassium iodide paper* one part chlorine in 30,000 parts water; *litmus paper* was found to be more delicate and reliable than *lacmoid paper.*—*Pharm. Centralhalle*, 1891, 314.

Purification of chemicals by great cold.—Prof. Pictet who about a year ago moved his laboratory from Geneva to Berlin, has since been engaged in experiments having for their object the elimination of impurities from chemicals by the aid of low temperatures. The first source of cold is a mixture of liquefied carbonic and sulphurous oxides (obtained by heating strong sulphuric acid with carbon); this, if under a pressure of 4–12 atmospheres, will produce sufficient cold on evaporation to liquefy nitrogen monoxide; the latter under a pressure of 200–400 atmospheres will liquefy air, hydrogen, oxygen and nitrogen. The experiments made upon the purification of chloroform are very interesting: The purest chloroform of commerce subjected to a cold of —70° C. deposits a crystalline body, which is removed and the liquid portion subjected to a temperature below —100° C., when the chloroform separates in crystals and is freed from a liquid portion. The chloroform purified by this treatment does not impart any color to sulphuric acid although they may be in contact for a long time; chromic acid mixture (bichromate of potassium solution and concentrated sulphuric acid) is reduced by the best commercial samples, while the chloroform purified by cold is unaffected; exposure to light for a long time without the addition of alcohol does not appear to induce decomposition. It has been suggested

that a pure glycerin might be made in the same manner.—Dr. H. Thoms, *Pharm. Centralhalle*, 1891, 275.

Sterilization of cat-gut.—In a test tube are put 8–10 drops of oil of juniper berries, which are then absorbed by introducing a little absorbent cotton; upon the cotton is placed the cat-gut in spiral-form, and the test tube closed as tightly as possible with a plug of absorbent cotton; by placing the test tube (in a horizontal position) in a sterilizing-oven for half an hour, at 150° C., the cat-gut is effectively sterilized without loss of flexibility or firmness.—Koch, Stuttgart, *Pharm. Ztg.*, 1891, 360.

Tincture of ferric formate.—(1) 150 gm. ferric chloride solution are diluted with 600 gm. distilled water; 100 gm. water of ammonia are diluted with 600 gm. distilled water. These solutions, chilled by surrounding ice, are allowed to run in thin streams into a vessel containing three liters of boiled distilled water; the precipitate is washed by decantation until free from chlorides, then collected upon a filter, allowed to drain, expressed, transferred to a vessel containing 100 gm. formic acid (sp. gr. 1·18) and dissolved by stirring. The solution is diluted with distilled water to 500 gm., and 500 gm. alcohol added; after standing, the clear liquid is decanted; this contains 3 per cent. of ferric formate. If this preparation be made at ordinary temperatures the ferric hydrate does not dissolve completely, and the finished preparation has a tendency to precipitate a basic salt.

(2) 75 gm. formic acid (sp. gr. 1·18) are neutralized with 35 gm. precipitated calcium carbonate, the calcium formate being held in solution by warming to 30° C.; 140 gm. ferric sulphate solution are mixed with 300 gm. distilled water and 25 gm. formic acid; add to this solution that of the calcium formate, stirring constantly; and, lastly, 500 gm. alcohol; allow to stand 5–6 hours, filter and wash the precipitate with dilute alcohol until the filtrate measures one liter. This tincture also contains 3 per cent. ferric formate.—M. Rozsnyai (Gyogysz. Hetilap.) *Pharm. Post*, 1891, 402.

Assay of cinchona for total alkaloids.—20 gm. in *very fine* powder are placed in a flask holding 500 cc., 10 cc. water of ammonia (10 per cent.) and 20 cc. alcohol (94 per cent.) added, the mixture well shaken and 170 cc. ether added; allow to stand for 2–3 hours, occasionally shaking, and decant 100 cc. of the clear liquid into a sepa-

rating funnel containing 50 cc. water and 2 cc. dilute sulphuric acid (sp. gr. 1·117), or sufficient to give the aqueous solution an acid reaction after agitation with the ethereal solution; separate the acid, yellowish solution from the ethereal layer, warm to expel the dissolved ether and return to the cleansed separating funnel; add 30 cc. chloroform, then sufficient sodium hydrate solution to precipitate the alkaloids, and agitate *at once* for several minutes; the chloroform solution is removed to a small tared flask and the agitation repeated with portions of chloroform of 20 cc. each until the alkaline solution after acidifying, fails to give a precipitate with iodine solution; distil off the chloroform or allow to evaporate, and dry the contents of the flask at 100° C. to constant weight. In case the chloroform forms an emulsion when shaken with the alkaline solution, this is poured upon a filter, well wetted with chloroform, stirred with a glass rod and washed with a little chloroform. The success of this method depends largely upon the fineness of the powder used.

This method was deemed the best one for the assay of cinchona, and is recommended by the committèe for the new Swiss Pharmacopœia.—W. Haubensak, *Schwz. Wochenschr. f. Pharm.*, 1891, 147.

The manufacture of metallic sodium by electrolysis of the fused chloride has not been successful in practice because of the high temperature at which sodium chloride melts, this bringing about reunion of the two elements; a patent has recently been granted to L. Grabau, in which the melting point of sodium chloride is considerably reduced by addition of potassium and strontium chlorides. The metal obtained by electrolysis of a mixture containing 3 molecules each of sodium and potassium chlorides and 2 molecules of strontium chloride is entirely free from strontium, but contains about 3 per cent. potassium, from which it may be freed, if necessary, by an oxidizing fusion; the yield is about 95 per cent.; during electrolysis the bath may be kept of proper composition by addition of sodium and potassium chlorides.—(*Ztschr. f. angew. Chemie.*) *Pharm. Centralhalle*, 1891, 345.

Anagallis arvensis, used in Mexico instead of saponaria, has been found by Dr. Schneegans to contain two glucosides identical with those obtained from quillaia and senega.

The aqueous decoction is precipitated with neutral lead acetate; the precipitate, thoroughly washed with water containing lead acetate, is suspended in water and decomposed by dilute sulphuric

acid, the excess of the acid neutralized by lead carbonate, the mixture filtered, the filtrate evaporated to dryness, the residue dissolved in boiling absolute alcohol, four volumes of chloroform added, the precipitate removed and the filtrate mixed with ether until precipitation ceases; this precipitate, dried over sulphuric acid, corresponds with quillaic and polygalic acid. It is soluble in water, dilute alcohol and boiling absolute alcohol; the aqueous solution has an acid reaction, foams strongly and reduces Fehling's solution after boiling with dilute acids; it has a sharp, acrid taste.

The filtrate from the lead acetate precipitate is precipitated with basic acetate of lead and the precipitate purified as above, avoiding, however, the use of chloroform; by repeatedly dissolving in hot alcohol and precipitating with ether, and drying over sulphuric acid a yellowish powder was obtained identical with sapotoxin and senegin. It is easily soluble in water, dilute alcohol, also in hot absolute alcohol; the aqueous solution is neutral, foams strongly, reduces Fehling's solution after boiling with acid, and gives a precipitate with basic lead acetate which is soluble in acetic acid.—*Journ. Pharm. von Els.-Lothr.*, 1891, 171.

ABSTRACTS FROM THE FRENCH JOURNALS.

TRANSLATED FOR THE AMERICAN JOURNAL OF PHARMACY.

PREPARATION OF TINCTURES.—M. Vauthier, a Paris pharmacist, describes, in the *Répert. de Phar.* of May 10th, a simple apparatus for the above purpose. It consists of a wide-mouthed jar into the opening of which is inserted a smaller jar whose bottom is pierced with small holes, the perforated portion falling far enough below the shoulder of the larger jar as to become fairly well immersed in the alcohol with which the latter is filled, the smaller jar having previously received the iodine or resin to be dissolved; the charged portion of the solution goes to the bottom of the jar, leaving the unsaturated portion of the alcohol always in contact with the drug, thus insuring very rapid dissolution. Excellent results are also obtained in the preparation of many other tinctures. An advantage of the apparatus lies in the fact that it is not necessary to watch or handle it until the solution is completed.[1]

[1] During the past fifty years this process of *circulatory displacement* has been frequently described and recommended.—See Amer. Jour. Phar. viii, 89; xvi, 313; xxii, 380; xxiv, 318; xxvi, 17, etc.—EDITOR.

LARD AND VASELIN IN OINTMENTS.—M. Carles lately stated, in the *Jour. de Méd. de Bordeaux*, that benzoated lard was preferable to vaselin in the preparation of ointments, because it permitted an easier absorption of the medicament associated with it. Dr. Dubreuilh replies in the same journal (Apr. 12) that in certain cases the use of vaselin is more advantageous. This is especially true of ointments containing corrosive sublimate, oxide of mercury or any other substance which undergo alteration on contact with fats. Also, the non-absorption of vaselin is advantageous when ointments are to be used as dressings. Lard dries too quickly and does not prevent evaporation from the surface of the skin. A vaselin dressing will last for a day, and its viscosity prevents its being too readily disturbed. Lard is preferable (when a profound effect is required) through its capability of being absorbed; vaselin should be used when we want a protective covering.

TRANSFORMATION OF CUPREINE INTO QUININE.—Referring to the announcement that Grimaux and Arnaud had succeeded in making quinine by synthesis (*Compt. rend. Acad. des Sci.*, Apr. 13), the editor of *Répert. de Phar.*, May 10th, says: "This assertion is not strictly correct; we would not detract from the merits of these able chemists, but it is admitted that we cannot really obtain quinine by synthesis until we shall have succeeded in preparing it from an artificial body. Grimaux and Arnaud obtained their quinine by operating with cupreine, a natural product; hence, they have simply transformed the latter into quinine. Indeed, these chemists gave their labors the unpretentious title of a 'transformation.' Cupreine is a base of *quina cuprea* or *Remigia pedunculata*, soluble in alkalis, colored by perchloride of iron and appearing to have a phenolic character. If we compare its formula ($C^{19}H^{22}N^2O^2$) with that of quinine ($C^{20}H^{24}N^2O^2$) we find the same relation between these bases as exists between phenol (C^6H^6O) and its methylic ether (C^7H^8O). Cupreine being a body of mixed functions, part base and part phenol, quinine would be its methylic ether. This prevision was confirmed by the authors. They added soda to cupreine in a solution of methylic alcohol, and this heated with an excess of iodide of methyl, formed two iodomethylates of quinine. In replacing the iodide by the chloride of methyl and heating to 100° C. in sealed tubes for 12 hours free quinine was obtained. The product of the reaction was evaporated to dryness and that portion of the cupreine not transformed was

removed by a weak solution of soda. Agitation with ether dissolved the quinine, which, being transformed into the sulphate, presented the usual characters of that compound. It is notable that the natural products of certain plants often include the methylic, but never the ethylic group. The transformation of cupreine into quinine demonstrates the existence, in the latter of the group (OCH^3). More than this, it will permit us to obtain new bases analogous to quinine, which, like that substance, will constitute cupreinic ethers. These bases will, perhaps, furnish new resources to therapeutics."

COMBINATIONS OF CAFFEINE WITH RESORCIN, AND OF THE PHENOLS WITH EUCALYPTUS AND ANTIPYRINE.—At a meeting (Apr. 1) of the Paris Society of Pharmacy, M. Léger read a communication from M. Barbey concerning these new products. Their description is not yet reported. About the combinations of the phenols with antipyrine, M. Patein observed that they had no interest from a therapeutic point of view, from the fact that they decompose rapidly in the organism.

EXAMINATION OF CASTOR OIL FOR COTTON-SEED OIL.—Mix 10 gm. of oil of ricinus with 6 gm. of a reagent, composed as follows: Nitrate of silver, 5 gm.; nitric acid, 1 gm.; alcohol, 100 gm. This mixture should be well stirred, and placed for 5 minutes upon a water-bath heated to 100° C. If cotton-seed oil be present there will be a red coloration, but if the oil of ricinus is pure there will be no change.—*Boll. farm.* No. xxx, Feb., 1891.

TOXICITY OF OIL OF SALVIA.—MM. Cadéac and Albin (*Société de Biologie*, Apr. 11) report that oil of sage is more toxic than essence of absinth, and gives rise to attacks of epilepsy, commencing by tonic and followed by clonic convulsions. An intravenous injection of 5 cgm., caused epileptiform attacks in a dog; 10 cgm. determined several successive attacks of the same nature.

COMBINATIONS OF ALCOHOL WITH THE ALKALINE SULPHIDES.—At the April meeting of the Paris Society of Pharmacy, M. Prunier communicated the results of M. Demond's researches on this subject. The latter obtained crystallized combinations with these sulphides, chiefly with the sulphide of sodium. One of them contained 1 molecule of alcohol and 1 of alkaline sulphide, and another was formed of 1 molecule of alcohol and 9 molecules of sulphide.

A NEW REAGENT FOR OXIDE OF CARBON.—M. Berthelot (*Bull. de la Société chimique*, Apr. 20) writes that oxide of carbon has the

power of reducing ammoniated nitrate of silver. This reagent is prepared by adding diluted ammonia, drop by drop, to a solution of nitrate of silver until the precipitate shall be entirely redissolved, but adding no more than this. If, into the above solution we pass a few bullæ of oxide of carbon, the liquor, without heat, becomes quickly of a brownish color; with ebullition there forms an abundant black precipitate The reaction likewise takes place with an aqueous solution of oxide of carbon. As the reagent is very sensitive and will operate in the presence of atmospheric air, it may be used to ascertain the presence of traces of oxide of carbon in gaseous atmospheres, provided no other reductive substance be present.

NITRATE OF STRONTIUM.—In the *Répert de Phar.* of May 10th, Dr. Boutron, a professor in the Nantes School of Medicine and Pharmacy, writes as follows in confirmation of Dr. Laborde's statements as to the innocuousness of strontium salts (see AM. JOUR. PHAR., 1891, p. 129): "In 1885, when I was in the service of Dr. Vulpian at the Hôtel-Dieu he gave to a patient suffering from acute articular rheumatism, 25 gm. (*that is to say, twenty-five grammes*) daily, of nitrate of strontium. The treatment was continued for about two months and did not appear to cause the least inconvenience to the patient. It was withdrawn because it ceased to have further action, and was replaced by salicylate of lithium in doses of 5·50 gm. daily.

THE NATURE OF SOLUTION.

An answer has long been sought to the question, "What goes on when a solid substance is dissolved by a liquid?" Those who received their course of didactic instruction a good many years ago were taught that the solid substance was *liquefied.* It was said that the particles of a fusible salt, such as nitre, for instance, could be brought into the liquid condition by one of two methods; the first that of applying heat, heat-energy being used up in the process of liquefaction; the second process being that of submitting the body to the action of water, when the absorption of heat due to liquefaction was shown by the lowering of temperature. This explanation of the process of solution has been long since found unsatisfactory, and in more recent years teachers have preferred to say as little as possible about a process in appearance so simple, but of which the explanation was found to be encompassed with

difficulties. Of late, however, the question has assumed another aspect. We have not attained, it is true, to unanimity of opinion as to what goes on in the process of solution, but there is nevertheless a perfectly definite theory of the process now current, which has the strenuous support of a prominent school of continental chemists. A complete account of the new theory has recently appeared in an accessible form in Oswald's "General Chemistry." In this work the *pros* rather than the *cons* of the question are dealt with. Exceptions yet remain to be explained, and fundamental experiments will have to be repeated and confirmed by independent workers, before the new theory can be looked upon as firmly established. Whatever may be the final judgment of the chemical world, the adequacy of the new theory to explain the phenomena of solution is undoubtedly one of the great scientific questions of the day.

The following is a short *résumé* of the theory and the data on which it is based.

The particles of a body in solution are not in the liquid, but the gaseous condition; that is to say, they obey laws having exactly the same form as the laws of gases. In dilute solutions the conditions are similar to those in a perfect gas; concentrated solutions show deviations from the simple laws which are similar and in the same direction as the deviations from the laws of Boyle and Charles shown by gases near the point of liquefaction. If pure water be poured on the surface of a solution of sugar the particles of sugar rise against the action of gravity and mix with the pure water. There are certain substances with which we can build up a "semi-permeable wall" which will allow the water to pass but not the dissolved substance. A porous earthenware cell in and on which is deposited copper ferrocyanide forms such a wall. Its properties are not the same as those of an animal membrane, such as parchment, which will allow crystalline substances in solution to pass through it. If a cell containing a sugar solution be provided with such a semi-permeable wall and is further connected with a pressure gauge, then on immersing the cell in a vessel of pure water, water passes slowly into the cell, the sugar does not pass out, and the particles of the dissolved substance exercise a pressure on the solvent which is registered by the manometer. The maximum pressure is only obtained slowly, but is of considerable magnitude, a one per cent. solution of sugar showing a maximum pressure of

about 50 cm. of mercury. The arrangement described affords us then a means of measuring the pressure exerted on the solvent by the particles of a substance in solution. It is found that this pressure is directly proportioned to the concentration of the sugar solution. All the other substances which have been investigated follow this law—pressure varies as concentration. It will be noticed that this law is of exactly the same form as that of Boyle, which states that the pressure of a gas varies inversely as the volume, *i. e.*, directly as the concentration.

Again, the pressure of the dissolved substance increases as the temperature rises, and for all substances so far investigated the rate of increase is the same as in the case of gases. With gases, if the volume be maintained constant, the pressure varies directly as the temperature reckoned from the absolute zero of the air thermometer. This is Charles' law, followed, as has been said, by dissolved substances as by gases. We see then that the general relation of volume, *i. e.*,

$$\frac{1}{\text{concentration}},$$

to pressure and temperature is the same for dissolved substances as for gases. For either case we may write:

Volume varies as pressure $\times$ temperature, or

Volume = pressure $\times$ temperature $\times$ a constant quantity.

The most striking evidence in favor of the view that substances in solution are in the gaseous state is afforded by the fact that this *constant* has the same value for dissolved substances as for gases; in other words, a dissolved substance at a certain temperature and which exercises on the solvent a certain pressure, occupies the same volume as it would if under these conditions of temperature and pressure it were in the form of a gas. An example will make this striking relation clear. At 0° C. and 760 mm. of mercury pressure, the molecular weight of any gas expressed in grams occupies 22,380 cc. The pressure of 760 mm. of mercury is 1,033 grams per square cm., which number expresses the pressure in absolute units; 0° C. = 273 on the scale of absolute temperature; therefore the value of the constant for a gas is:

$$\frac{1{,}033 \times 22{,}380}{273} = 84{,}700 \text{ approximately.}$$

Now take the case of sugar in solution. The molecular weight expressed by the formula $C_{12}H_{22}O_{11}$ is 342. In a 1 per cent. sugar solution therefore the molecular weight expressed in grams occupies 34,200 cc. At 0° C. the pressure on the solvent is found to be equal to 493 mm. of mercury, that is to say, 671 grams per square centimeter. The *constant* for sugar is therefore:

$$\frac{671 \times 34{,}200}{273} = 84{,}200$$

which agrees to within 6 parts in 1,000 with that for gases. As this relation is not special to the case of sugar but is a general relation, it follows that Avogadro's law is obeyed by substances in solution, equal volumes of which, at the same temperature, and exercising the same pressure on the solvent, contain equal numbers of molecules.

It is well known that the abnormal vapor densities of certain bodies which we now know to be *dissociated* in the gaseous state long opposed an obstacle to the acceptance of Avogadro's generalization. The exceptions met with in the case of substances in solution are of exactly parallel character. The deviations from the law are always in one direction, giving too great a volume when the calculation is based on the received molecular weights. This is met by the hypothesis that such exceptional substances are to some extent dissociated in solution. As in the case of gases so also in the case of substances in solution, many bodies occupy a volume twice as great as that calculated from their molecular weight. These are regarded as being completely dissociated into two constituents. The most important classes of substances which behave thus are the strong acids and bases and their salts. A large number of phenomena afford evidence in support of this hypothesis of dissociation in solution, the study of which now constitutes an important field of work connected with the development of the new theory of solution.—*Phar. Jour. and Trans.*, May 16, p. 1018.

NATAL ALOES.

By E. M. Holmes, F.L.S.

There has for many years been a difficulty in determining the botanical source of the article known in commerce as "Natal," or sometimes as "Hepatic" Cape aloes.

In appearance the drug bears a strong resemblance in color and

opacity to true Hepatic aloes, but differs from it in four particulars, (1) in odor, which resembles that of Cape aloes; (2) in the color of the powder, which has a greenish-brown, not yellowish-brown, tint; (3) in the chemical reaction with nitric acid, and (4) in the fact that it yields a distinct aloin.

Some months since, hoping that more light might be thrown on the question by examining the juice of leaves of authenticated plants, I suggested to Messrs. Bainbridge and Morrow that they should investigate the subject from this point of view. Their results, published in the *Pharmaceutical Journal* ([3], xx, p. 570), were unexpected, and led to the conclusion that *Aloe succotrina* alone, of all the leaves examined, was the most likely source of the Natal aloes of commerce.

I then wrote to Mr. J. Medley Wood, asking him to make further inquiry concerning the botanical source of the drug, and the Director of Kew Gardens, who had already most courteously furthered my wishes by supplying the aloe leaves necessary for Messrs. Bainbridge and Morrow's investigation, also wrote officially to Mr. Wood, with the result that the latter sent some aloes prepared in Natal (as described in the Kew *Bulletin*, No. 44), to Kew (see *Am. Jour. Pharm.*, 1891, p. 33). A small portion of this was kindly placed at my disposal by the Director. This specimen, however, resembled Cape aloes in its translucent appearance, and not Natal aloes.

This specimen I handed to Mr. Bainbridge to test in the same manner as the aloes previously examined. As will be seen from the table given by Mr. Bainbridge the aloes, although translucent, agrees with the opaque Natal aloes and with the juice of *A. succotrina*, in its chemical reactions.

I then asked him to make comparative experiments with some aloes and aloe juice obtained from plants growing near Port Elizabeth, which were presented February 9, 1885, by Mr. Albert Walsh, of the firm of B. G. Lennon & Co., together with a living plant. The plant I had compared at Kew with the living specimens in the collection there, and it appeared to agree fairly well as regards the leaf with *Aloe platylepis*, Baker. The plant presented by Mr. Walsh was handed to the then Curator of Kew Gardens, Mr. Smith, for cultivation, but it died without flowering.

The results of Mr. Bainbridge's examination shows that this

aloes corresponds with the Cape aloes, and not with that known as Natal.

I may add that I carefully evaporated some of the juice in a water-bath soon after its arrival, but that the resulting aloes was *translucent.*

I think it may, therefore, be concluded, since the translucent Natal aloes sent by Mr. J. M. Wood gave the same reactions as opaque or Hepatic Natal aloes, that the aloes known in English commerce as Natal, or Hepatic Cape aloes, is the product either of *Aloe succotrina*[1] or some species the juice of which gives the same chemical reaction, and that its opacity is probably due to some peculiarity in the mode of manufacture. Further, it appears probable that different species are used in different districts in Natal, and that no botanist has yet seen the opaque aloes manufactured.

It may be hoped that Mr. J. Medley Wood, aided by the light already thrown on the subject by Messrs. Bainbridge and Morrow, may be able ultimately to clear up the history of the opaque Natal aloes.—*Phar. Jour. and Trans.*, April 4, 1891, p. 898.

EXAMINATION OF SPECIMENS OF SOUTH AFRICAN ALOES.

By J. Bainbridge.

Some specimens of aloes and aloes juice were recently handed to me for examination by the Curator of the London Museums of the Pharmaceutical Society. These consisted of, (1) a small sample of the aloes from Natal, sent to Kew by Mr. J. Medley Wood, a note upon which, quoted from the Kew *Bulletin*, has already appeared in the *Pharmaceutical Journal* (p. 495);[2] (2) aloes prepared from a South African species, and believed by Mr. E. M. Holmes to be *Aloe platylepis*, or an undescribed species closely allied to it; (3) some juice of the last-named, which had been in the Museum since 1885.

For the sake of uniformity in the results the same method of testing was adopted for these samples as described in the *Pharmaceutical Journal*, January 18, 1890, p. 570.

[1] Since the reactions given by the juice of *A. ferox*, Mill., in the Kew Gardens and those of the juice of the plant believed by Mr. Wood to be *A. ferox* are different, it is obvious that the evidence is not sufficient to attribute Natal aloes (as distinct from Cape), to *A. ferox*. Further comparison of Mr. Wood's *A. ferox* with allied species may show that it is distinct.

[2] See *American Journal of Pharmacy*, January, 1891, p. 33.

There is an absolute identity in the results between the specimen of *A. ferox*, obtained from Mr. Wood, and the large number of commercial specimens of Natal aloes that had been previously examined. In comparison with the aloes obtained from plants grown at Kew, I find that it resembles most closely in its reactions those obtained from *A. succotrina*. The only reaction in which they do not agree is the bromine test, but this reaction is not considered as a proof that the commercial Natal aloes are not derived from this species, but that it is possible that the property might be lost on keeping or by fermentation. The reactions of the aloes from the plant supposed to be *A. platylepis* are similar to those of commercial Cape aloes.

The results are recorded in the following table:

TABLE OF RESULTS.

Specimens.	HNO_3.	H_2SO_4 and vapor of HNO_3.	Cripps and Dymond.	C. and D., with NH_4HO.	Bromine Test.	Fe_2Cl_6.
Natal aloes, from "*A. ferox*," J. M. Wood, . .	Permanent crimson.	Blue.	Deep crimson.	Intense brown-red.	No effect.	Olive-green.
A. ferox, grown at Kew, .	Evanescent. crimson.	Green.	Pale yellow.	Red.	Violet.	Olive-green.
Commercial Natal aloes, .	Permanent crimson.	Blue.	Deep crimson.	Intense brown-red.	No effect.	Olive-green.
A. succotrina, grown at Kew, ...	Permanent crimson.	Deep blue.	Crimson.	Intense brown-red.	Deep purplish red.	Olive-green.
Aloes prepared from *A. platylepis*, grown near Port Elizabeth, ...	Green after standing a few minutes.	Nil.	Orange-red.	Pale claret.	Nil.	Olive-green.
Juice of *A. platylepis*, . . .	Beautiful emer.-green.	Nil.	Orange-red.	Pale claret.	Nil.	Olive-green.

—*Phar. Jour. and Trans.*, April 4, 1891, p. 899.

ANALYSIS OF BRANDY AND ALCOHOL.[1]

BY E. MOHLER.

Ethereal salts.—100 cc. of the distilled alcohol is boiled for an hour with 20 cc. of decinormal potash in a reflux apparatus; the excess of potash is determined, and the rest is calculated to ethyl acetate.

Aldehydes are estimated by means of the coloration with rosaniline bisulphite, the intensity of the color of the solution examined being compared, by means of a Duboscq colorimeter, with the coloration given by a solution of aldehyde of known strength; 10 cc. of

[1] *Compt. rend.*, **112**, 53-55; *Jour. Chem. Soc.*, 1891, 503.

a 0·01 per cent. solution of acetaldehyde in alcohol of 50° is a convenient quantity to employ as a first standard.

Higher alcohols.—100 cc. of the distilled liquid is mixed with 1 cc. of aniline and 1 cc. of phosphoric acid of 45° B. to retain the aldehydes, and after cohobating for an hour, is distilled to dryness in a solution of salt. The distillate is treated with sulphuric acid of 66°, and the coloration is compared with that given by an alcohol containing 0·250 gram of isobutyl alcohol per litre.

Nitrogen compounds.—100 cc. of the undistilled liquid is distilled to dryness with 2 cc. of a solution of phosphoric acid of 45° B., the residue is dissolved in about 1,000 cc. of distilled water, mixed with 10 grams of sodium carbonate, and distilled, the distillate being nesslerized. Alkaline potassium permanganate is then added, and distillation and nesslerizing is repeated. The first operation gives the nitrogen present as ammonium compounds and amides, and the second gives the nitrogen existing as pyridine bases and alkaloids.

Several analyses of brandy and alcohol are given.

CHEMICAL ANALYSIS OF THE PANCREATIC JUICE IN MAN.[1]

By J. Zawadzki.

The author states that all our knowledge of the pancreatic juice has been derived hitherto from experiments on the lower animals. In man, as yet, only two analyses have been made, and these in the case of juice obtained post-mortem.

The pancreatic juice analyzed by Zawadzki was obtained from a girl, who had been operated upon for the removal of a pancreatic cyst. For 14 days an abundant secretion appeared, at first purulent, then watery. After four weeks the wound healed completely.

The pancreatic juice for 24 hours was collected and analyzed. It was tenacious, yellowish, turbid, and had an alkaline reaction. The deposit contained large epithelial cells, mucous corpuscles, and fine granular detritus, but no crystals. In the ashes were found compounds of carbonic, sulphuric, phosphoric and hydrochloric acids. The bases were sodium, calcium, potassium and iron. The juice contained coagulable albumen and hemi-albumose, but no peptone.

By the action of the juice on starch for five hours, at a suitable

[1] *Oest.-ungar. Centralblatt für die medicinischen Wissenchaften*, No. 6, 1891; reprinted from *The Medical Chronicle*, April.

temperature, maltose was obtained. The action of the juice for four hours on the white of egg gave peptone only, and neither albumen nor propeptone. Finally, the juice emulsified oil.

The analysis gave the following results:

Water,	86·405 per cent.
Solids,	13·395 "
Organic compounds,	13·251 "
Albuminous bodies,	9·205 "
Extractives,	4·046 "
Other extractives soluble in alcohol,	0·827 "
Salts,	0·344 "

MODERN DERMATOLOGICAL REMEDIES.

The following information respecting some of the newer forms of external remedies used in the clinic of Professor Hebra, Vienna, is published in the *Pharmaceutische Post*, and reprinted from *Pharmac. Journal and Transactions*, May 23:

Spray Treatment.—Very frequently an ether spray is used as a vehicle for mercuric sublimate (1 to 2 p.c.) and chrysarobin (10 p.c.). It is considered that the spray, besides its anodyne properties presents the advantage of attacking affected parts otherwise difficult to reach, such as those covered with hair. Whilst the mercuric chloride spray does good service principally in affections of the mucous membrane the chrysarobin spray is used in mycosis of the skin. The apparatus used is one combined with a ball blower.

Medicated Soaps.—The super-fatted medicated soaps introduced by Unna, are used in a form as improved by Eichoff. The basis consists preferably of beef tallow, together with liquor sodæ two parts, liquor potassæ one part and some olive oil. The super-fatted soaps employed are the resorcin-salicylic, resorcin-salicylic-sulphur, and the resorcin-salicylic-sulphur-tar soaps. In these forms the resorcin is claimed to develop advantageously its action antagonistic to inflammation; the salicylic acid is said to dissolve the horny layer of the epidermis and to act as a bactericide; the sulphur also lowers the inflammation; while the tar diminishes the itching and favorably influences the dilated vessels.

Glycerinum Saponatum.—This is an ointment basis, containing a large proportion of glycerin, in the preparation of which a small quantity of the neutral cocoanut oil soda soap is used. Its composition varies from 80 to 92 per cent. of glycerin and 20 to 8 per

cent. of soap. The *glycerinum saponatum* is soluble in cold and warm water, and is said to possess the advantageous property of dissolving a large number of substances, and of holding other insoluble pulverulent substances in suspension. To this class belong:

(*a*) Ointments with an Acid Basis (80 p. c. glycerin).—(1) *Glycerinum Saponatum* with salicylic acid (5 p. c.), employed especially for the removal of horny epidermal growths; (2) Glyc. sapon. with salicylic acid (5 p. c.) and resorcin (5 p. c.) combines the properties of the preceding with those of resorcin, in diminishing the inflammation, acting as an antiseptic and promoting the regeneration of the epidermis; (3) Glyc. sapon. with salicylic acid (5 p. c.), and creasote (5 p. c.) promotes healing without pain in lupus vulgaris, lepra, etc.; (4) Glyc. sap. with salicylic acid (3 p. c.) and tar (10 p. c.), useful in scaly eczema with itching.

(*b*) Ointments with a Neutral Basis (92 p. c. glycerin).—Glyc. sapon. with zinc oxide (5 p. c.) used for cosmetic purposes and in slight cases of eczema; (2) Glyc. sapon. with sulphur (10 p. c.); (3) Glyc. sapon. with zinc oxide (10 p. c.), used in acne; (4) Glyc. sapon. with iodoform (5, 10, to 50 p. c.), said to be remarkably active, purifying and promoting granular action in wounds, ulcers, buboes and carbuncles. (5) Glyc. sapon. with chrysarobin (10 p. c.), approved especially in psoriasis; (6) Glyc. sapon. with hydroxylamine (1 p. c.), used in psoriasis of the face and hairy scalp; (7) Glyc. sapon. with ichthyol (5 p. c.), renders good service in violent itching of skin affections and arthritic swelling of the joints; (8) Glyc. sapon. with ichthyol (10 p. c.) and zinc oxide (10 p. c.), as in the preceding and in incipient eczema; (9) Glyc. sapon. with carbolic acid (2 to 3 p. c.) is good for disinfecting the hands and also to relieve itching.

In other cases the vehicle represents a kind of dressing. Among the *Pastes*, the zinc-starch-vaselin paste, with corresponding medication, takes a high place. This paste is used with good result in combination with salicylic acid (acid salicyl., 1–2; zinci oxidi et amyli, āā 25; vaselini, 50). The paste adheres to the face without any bandage; it is also dusted with starch. In the *Traumaticin* treatment, traumaticin (a solution of one part of gutta-percha in ten to fifteen parts of chloroform) is used as a medium for applying different remedies, such as chrysarobin, etc. It forms a pliant coating and surpasses collodion by far in this respect.

Glycero-Gelatin is prepared in three forms: Soft (5 p. c. gelatin added), hard (10 p. c. gelatin and water) and hard (10 p. c. gelatin without water). Before using the preparation is liquefied by heat, and in this condition is spread on to the part affected by means of a brush and covered with mull.

In the preparation of Ointment and Plaster Mulls Unna's recommendation is followed to substitute lard by mutton fat, which renders unnecessary additions of paraffin or wax. The dressings are dipped into the melted mass, dried and rolled up. The gutta-percha mull is considered to present many advantages.

A new kind of dermatological plaster has been introduced, the basis of which consists of purified india-rubber and anhydrous lanolin worked up together to a remarkably adhesive mass. The mixture is medicated with various substances and spread upon linen and is then known as *Collemplastrum.* Among the advantages claimed for this kind of plaster are its low cost, that the mass does not separate from the linen, that while possessing the adhesive properties of india-rubber plaster, the lanolin favors the absorption of the added medicament, and that the plaster can be readily removed without leaving portions adherent to the skin. Besides the simple collemplastrum adhæsivum, others are used containing respectively 10 to 20 p. c. salicylic acid, 30 p. c. pyrogallic acid, 60 p. c. mercury, 60 p. c. mercury and 5 p. c. carbolic acid, 50 p. c. thiol, 40 p. c. zinc oxide, 10 p. c. liquid pitch, etc.

GERMS AND DISEASE.

If an infusion of hay or any vegetable substance be kept in a warm place for some days and a drop be then examined under a microscope it will be found to swarm with bodies which, from their power of movement, appear to be endowed with life. An infusion of meat under similar conditions gives the same result. Some of these minute living bodies belong to the animal world, some are classed as plants. All of them owe their origin to "spores" or seeds carried to the infusion by the air, and produced by pre-existing plants or animals of the same species. At one time it was held by some scientists of repute that these organisms were spontaneously generated from the decaying matter in the infusion. The fallacy of the experiments on which this theory was based has, however, been exposed—mainly by the researches of Tyndall and Dallinger.

Chief among the organisms visible in the drop of meat infusion are numbers of rod-shaped bodies vibrating in a most characteristic manner. These are the lowest forms of plant life, being composed of a single cell and reproducing their kind by simple division of their bodies. They are known to naturalists as *bacteria*. Among these microscopic plants we have as much divergence in form and properties as can be found among the higher plants that people our fields and lanes and gardens. The remarkable difference in properties characterizing some of the latter which so closely resemble each other in form as to be placed by botanists in the same order is a fact now generally recognized. Thus, we have such a poisonous plant as *Belladonna*, or "deadly nightshade," belonging to the same order as the potato and scarcely distinguishable from it by the untrained eye; the hemlock, too, claims as close relations to the carrot, the parsley, the caraway and the coriander. The bacteria found in infusions of hay and of meat correspond to the useful plants, for besides being in themselves harmless, they act as nature's scavengers by feeding on and converting into its component elements the putrefying matter among which they live. Corresponding to the poisonous plants, we have the bacteria which are the essential factors in the production of infectious diseases and popularly known as "disease germs."

The "germ theory" of disease is not a product of to-day, but was mooted as long ago as 1675. Since that time it has passed through many phases, and been to all appearances as completely proved as it has afterwards been disproved. The "snow-white cube of truth," of which all the theories have been mere vestments, still survives, however, and its recognition has been rendered certain by the more accurate methods of research and the more perfect instruments brought to bear on its numerous manifestations within recent years. Since the discovery by Pasteur—fully twenty years ago—that a disease which caused great ravages among silk worms in France was caused by a micro-organism, progress has been continuous. In 1877, Koch published the result of his researches on the life history of the *bacillus*—a species of *Bacterium*—of splenic fever. His observations were confirmed by Pasteur, who also showed how the bacillus might be weakened or "attenuated," so that inoculation with the attenuated form prevented or mitigated the more virulent disease. These researches laid the

foundation for the methods now adopted by Pasteur for the cure of hydrophobia and by Koch for the cure of consumption, methods which are now riveting the attention of the whole civilized world.

In consideration of the intense interest now being taken in the work going on in Berlin and the centres supplied from it, some explanation of the methods adopted for proving the presence of a disease-producing organism and for checking its ravages may not, it is hoped, be devoid of interest. The chain of evidence on which bacteriologists rely as proof of the presence of disease-producing bacteria is as follows:

(1) The organism must be found (by the aid of the microscope) in the blood or tissues of the affected animal.

(2) It must be transferred from these to nutrient solutions contained in test tubes (the nutrient materials of these solutions consist of gelatin and other meat products) and cultivated therein. These cultivations must be carried on through successive generations of the organism.

(3) A "pure cultivation" obtained in this way must, when introduced into a healthy animal, produce the disease in question.

(4) In the inoculated animal the same micro-organism must again be found.

In forging a chain of evidence such as this is, the greatest skill is required and the utmost precautions must be taken to prevent the entrance into the pure cultivations of other bacteria, which are present almost everywhere. All the apparatus used must be "sterilized," and the slightest neglect of details like this leads to hopeless confusion. Bacteriology is, in fact, an art requiring of its workers exceptional qualities and special training.

The methods adopted for curing or preventing diseases, which owe their origin to bacteria, vary with the disease under treatment, and the principles underlying them are not yet removed from the domain of theory. Pasteur, in his famous researches on hydrophobia, found that by various methods he could attenuate the virus of rabies so that when injected into a healthy animal it not only did not produce any untoward symptoms, but it actually prevented the most active virus from having any effect. The method he now adopts is that of suspending pieces of the spinal cord of inoculated rabbits in bottles of air, dried by means of potash. After hanging

a certain time under such conditions the virulence is found to have diminished. Injections of the virus so attenuated not only confer immunity against rabies, but actually prevent its development even if practised after the disease has been introduced into the system by the bite of a rabid animal. This is rendered possible by the exceptionally long incubation period of rabies.

In the case of *tuberculosis*, or consumption, the method employed is somewhat different, although it is probable that at some not very remote date, the principle underlying both methods may be shown to be the same. Koch found in the course of his observations that the bacillus of consumption when injected in cases of consumptive affections of the skin produced increased activity in the regions affected, resulting in the casting off of the affected skin and healing of the scars. By a series of masterly experiments and inductions he showed that it was not the bacillus itself which produced this effect, but a poison secreted by it. This poison he succeeded in extracting from pure cultures of the bacillus by means of a mixture of glycerin and water, and this is the fluid which, during the last few months, has been creating such a stir throughout the whole world. Whether the remedy will do all that newspaper correspondents have claimed for it is very questionable; but it is beyond doubt that its properties are most remarkable, and that it will be to the physician a most powerful auxiliary in the detection and treatment of some of the most insidious diseases to which flesh is heir.—*Phar. Jour. and Trans.*, May 16, p. 1019.

ARTIFICIAL SALICYLIC ACID.[1]

By W. R. Dunstan and O. F. C. Bloch.

Artificial salicylic acid has been observed to differ in its therapeutic action from the pure "natural" acid obtained from the oil of winter-green. Although much work has already been done on the subject with the view of ascertaining the cause of this difference, the exact nature of the impurities contained in the artificial acid of commerce has not been experimentally established. The authors have examined two foreign acids, isolated by Williams in 1878 from commercial salicylic acid, but not then identified. These acids are

[1] *Pharm. J. Trans.* [3], **21**, 429—436, abstract; reprinted from *Jour. Chem. Soc.*, 1891, 454.

now shown by their physical and chemical properties, as well as by the analyses of their silver and lead salts, to be orthocresotic or orthohomosalicylic acid [$CH_3 : OH : COOH = 1 : 2 : 3$], and metacresotic or metahomosalicylic acid [$CH_3 : OH : COOH = 1 : 3 : 4$] respectively. The ortho-acid melts at 163° (corr.), the meta-acid at 174·5° (corr.). They have been formed from the corresponding cresols contained in the crude phenol from which the salicylic acid had been prepared.

The melting point of pure salicylic acid has been variously stated, the highest recorded temperature being 159° and the lowest 155°. The authors find that "natural" salicylic acid, after recrystallization from alcohol, melts at 156·75° (corr.), and that if the acid melting at this temperature be converted into the sodium salt, and fractionally precipitated with silver nitrate, the acid recovered from each fraction of silver salt also melts at 156·75°, which may therefore be accepted as the melting point of the pure substance. By very slowly cooling a 1 per cent. solution in hot water, the pure acid may readily be obtained in large, distinct, prismatic crystals, but in presence of about 5 per cent. of one of the cresotic acids, the salicylic acid no longer furnishes large crystals, and the impure acid melts at a lower temperature.

A specimen of the artificial salicylic acid of commerce (m. p. 154·5°) was examined by Williams' method. It was converted into a calcium salt by boiling with water and calcium carbonate, and crystallized many times from water. From the residue of soluble salt from which most of the calcium salicylate had crystallized, there was obtained a small quantity of an acid, which after further purification melted constantly at 151° (corr.). Analysis of the silver and lead salts, as well as its physical and chemical properties, proved it to be paracresotic or parahomosalicylic acid

$$(CH_3 : OH : COOH = 1 : 4 : 3).$$

For the purposes of preparing pure salicylic acid from the impure acid of commerce, the method depending on the different solubilities of the calcium salts was not found satisfactory, being extremely tedious, owing to the number of recrystallizations that are necessary. A better plan consists in preparing the lead salts by the action of lead carbonate, and crystallizing these from dilute alcohol; lead salicylate being much less soluble than the lead cresotates. By

this means 70—80 per cent. of the original acid may be recovered in the form of pure salicylic acid from the first fraction of crystals deposited from the alcoholic solution.

At the request of the authors, Professor Charteris ascertained whether the three cresotic acids described above were poisonous. When administered in alcoholic solution to animals by injection, the ortho-acid was observed to be markedly toxic, the para-acid less so, whilst the meta-acid proved to be innocuous. (See this JOURNAL, January, p. 38.)

SUBERIN AND CORK CELLS.[1]

BY F. A. FLÜCKIGER.

Kügler (1884) showed that suberin contained an appreciable amount of fat and extracted stearic acid; he also isolated the crystalline *phellonic acid*, which, however, does not belong to the fatty series. Gilson (1890) maintains that *suberin* is that part of cork texture which is insoluble in neutral liquids, and is not taken up either by concentrated sulphuric acid or by ammonio-copper oxide solution, but is dissolved by alcoholic potash, and with nitric acid yields suberic and other fatty acids soluble in ether and alcohol. He finds the coloring matter of cork to be very soluble in sodium carbonate solution, which scarcely attacks suberin even on prolonged boiling. After treating finely divided cork with sodium carbonate, the suberin is extracted by a 3 per cent. alcoholic potash solution. The solution filtered hot gives a precipitate on cooling, which, after washing with water and recrystallization from alcohol, consists mainly of potassium phellonate. The alcoholic filtrate freed from alcohol, diluted with water, and treated with hydrochloric acid, gives a semi-fluid deposit; the decanted liquid yields glycerol. Gilson dissolves the deposit in ether, washes out the hydrochloric acid with water, expels the ether, dissolves in alcohol, and boils with potassium carbonate, when the addition of an alcoholic solution of magnesium chloride precipitates phloionic acid; the solution on further treatment yields suberinic acid. Kügler gives $C_{22}H_{42}O_3$ as the formula for phellonic acid, whilst Gilson prefers $C_{22}H_{43}O_3$. The latter gives the melting point as 102°. When heated at 105° with hydrochloric acid, the anhydride $C_{44}H_{84}O_5$ is obtained. *Phloionic acid*, $C_{22}H_{44}O_8$, is insoluble in cold water, but dissolves in hot water,

[1] *Arch. Pharm.*, **228**, 690—700; reprinted from *Jour. Chem. Soc.*, 1891, 465.

forming crystalline needles on cooling; it is very soluble in alcohol, but only slightly in ether and in chloroform; it melts at 62—63°. *Potassium phloionate* is very soluble in ether, less so in alcohol. *Silver phloionate* is rapidly decomposed in the light, whilst the corresponding phellonate is only slowly colored. *Magnesium phloionate* forms a crystalline precipitate when an alcoholic solution of a magnesium salt is added to a solution of phloionic acid. *Suberinic acid*, $C_{17}H_{30}O_3$, when gently warmed, forms a liquid miscible with alcohol, ether and chloroform, but not with light petroleum. Its alkaline salts are soluble in water, and alcohol; in the alcoholic solution no precipitate is produced either by magnesium or barium acetate. When heated without access of air, suberinic acid gradually forms a transparent, elastic mass, for which no solvent has yet been found. No water appears to be separated; the change appears rather to be due to polymerization. *Potassium suberinate* is soluble in water and alcohol, but not in ether. The *silver* salt is rapidly decomposed. Gilson has observed a characteristic test for phellonic acid, which consists in the beautiful reddish-violet color produced on moistening the acid with a very dilute alcoholic iodine solution, and adding sulphuric acid (sp. gr. 1·8); the reaction succeeds best with potassium phellonate, and may be obtained with iodine in aqueous solution of potassium iodide, or with iodine in zinc iodide. The foregoing relates entirely to cork from *Quercus suber*. Gilson has, however, glanced at that from *Ulmus campestris* var. *suberosa*, and finds that this is much poorer in suberin. It yielded phellonic and suberinic acids, but neither phloionic acid nor glycerol.

PHARMACEUTICAL COLLEGES AND ASSOCIATIONS.

The Pharmaceutical Examining Board of Pennsylvania held an examination in the Central High School of Philadelphia, January 19, when 109 candidates applied for registration as Pharmacists, of which number 30 passed the examination; and 51 out of the 89 applicants for Qualified Assistants' certificates. At the examination held at the Girls' High School, at Harrisburg, April 25, there were 107 applicants for Registered Pharmacists' certificates, and 49 for Qualified Assistants; of these numbers 71 and 38, respectively, were successful.

The Massachusetts College of Pharmacy held its twenty-third annual commencement, May 27, when President Sheppard conferred the degree of Ph.G. upon 27 candidates. Addresses were delivered by Professor G. R. Tucker and F. W. Day, Ph.G.

The New York College of Pharmacy held its sixty-first commencement

April 27, when 119 candidates received the degree of Ph.G. at the hands of Vice-President Massey. The valedictory address on behalf of the class was delivered by F. E. Nabers, and Mr. Milhau, president of the graduating class, presented to Professor Bedford a valuable watch, as a mark of their esteem. Before the close of the session Prof. Bedford had resigned his position, which he has creditably filled for a long period, intending to devote his entire time to other labors; to the success in his new field of work, he carries with him the best wishes of his numerous friends. The vacancy thus occasioned has been filled by the election of Prof. Virgil Coblentz. Prof. Coblentz graduated with honors at the Philadelphia College of Pharmacy in 1882, held for several years the chair of Materia Medica in the Cincinnati College of Pharmacy, and continued his studies in Germany, receiving the degree of doctor of philosophy at the University of Berlin.

The National College of Pharmacy, Washington, D. C., had its nineteenth commencement on the evening of May 12, when 20 candidates received the diploma through Professor Waggaman, the president of the College. Addresses were delivered by Hon. J. L. Chipman, and on behalf of the class by W. G. Roe.

The Alabama Pharmaceutical Association convened at its tenth annual meeting at Huntsville, May 12, and in the absence of the presiding officers was called to order by secretary Candidus. J. D. Humphrey, of Huntsville, presided. The usual reports claimed most of the attention, and the schemes for preventing cutting of prices were discussed, the resolutions passed at New Orleans being concurred in. Besides the officers mentioned before, the following were elected to serve for the ensuing year; M. F. Tucker, Mobile, vice-president; E. P. Galt, Selma, treasurer, and A. Van Antwerp, Mobile, local secretary. The next meeting will take place at Mobile, May 10, 1892.

The Arkansas Pharmaceutical Association met at its ninth meeting at Hot Springs, May 20, and transacted chiefly routine business. E. E. Shendal, Hot Springs, was elected president; J. W. Beidelman, Little Rock, secretary, and J. A. Jungkind, Little Rock, treasurer. The next meeting will convene at Fort Smith, in May, 1892.

The Connecticut Pharmaceutical Association held its fifteenth meeting at New Haven, February 3, president Gessner in the chair. Routine business, reports of committees, and discussions on cut rates and other topics claimed the attention of the association. E. A. Gessner was re-elected president, L. H. Goodwin treasurer, and F. Wilcox secretary. The next annual meeting will be held at Hartford in February.

The Florida State Pharmaceutical Association assembled in fifth annual meeting, at Jacksonville, May 19, president Rawls in the chair. A gold and a silver medal were awarded for two of the papers read at the meeting. A. E. Phillips, Sanford, was elected president; and secretary Watson and treasurer Delouest were re-elected. The next meeting will be held at St. Augustine, April 12, 1892.

The Georgia Pharmaceutical Association met at its sixteenth annual meeting in Augusta, May 12, president Goodwyn in the chair. The usual annual reports and several interesting essays were read and discussed. H. R Slack,

Jr., Lagrange, was elected president; M. H. Taylor, Macon, treasurer, and H. H. Arrington, Summerville, secretary. Columbus was selected as the place for holding the next meeting, May 10, 1892, and J. P. Turner was appointed local secretary.

The Indiana Pharmaceutical Association convened in Indianapolis, May 6, in tenth annual meeting, president Hurty presiding. The customary reports were read, several papers, chiefly of a practical nature, were read; Prof. Oldberg delivered a lecture on weights and measures and on the metric system; the action taken at New Orleans for regulating price cutting on proprietary articles was endorsed. Prof. Oldberg and L. M. Andrews were elected honorary members; W. C. Buntin, Terre Haute, president; G. G. Allen, Indianapolis, treasurer, and F. W. Meissner, La Porte, secretary.

The Kansas Pharmaceutical Association had its twelfth annual meeting, at Ottawa, May 19. Besides the annual reports, the reading of papers, the discussions on the pharmacy law and of other topics, a very attractive feature was the microscopic exhibition, including the use of the projecting microscope. C. L. Becker, Ottawa, was chosen president; J. T. Moore, Lawrence, secretary, and H. W. Spangler, Perry, treasurer. Kansas City was selected for holding the next meeting, the date of which will be announced hereafter.

The Kentucky Pharmaceutical Association held its fourteenth annual meeting at Frankfort, May 20, president Brooks in the chair. Reports of officers and committees were presented, papers were read on "Triturations," "soluble Pill coating," and other subjects; the plan adopted at New Orleans for preventing price cutting was concurred in; and the following resolution was adopted:

Resolved, That the Legislative Committee be and is hereby authorized to take such steps as may be deemed necessary to obtain an amendment to the existing pharmacy laws that will place druggists on a footing with grocers in the collection of debts, and make their claims against decedents for necessaries furnished during the last illness preferred.

The officers elected for the present year are.: W. Chapman, Frankfort, presi, dent; J. W. Gayle, Frankfort, permanent secretary, and H. Jett, Cynthiana-treasurer. The meeting adjourned to meet again at Carrollton, May 18, 1892.

The Louisiana State Pharmaceutical Association had postponed its ninth meeting from the second week in April so as to meet simultaneously with the American Pharmaceutical Association. President Breslin presided. Several papers were read, aside from the usual reports, and discussions were had on drug adulteration and on amendments to the pharmacy law; a motion by Prof. Metz, requesting the pharmacy department of Tulane University to change the degree of master in pharmacy, which is now conferred, to graduate in pharmacy so as to harmonize with other Colleges of Pharmacy, was opposed by former graduates of the university on the plea that the value of their diplomas would be reduced by such a step, and the matter was laid upon the table. The next meeting will again be held in New Orleans, the date being April 13, 1892. President for the current year is John Johnston; the corresponding secretary Mrs. E. Rudolf, the recording secretary L. F. Chalin, and the treasurer E. Lalmant, were re-elected.

The Maryland Pharmaceutical Association held its eighth meeting at the hall of the Maryland College of Pharmacy, April 16, Prof. Culbreth presiding. It was reported that the state pharmacy bill had passed the Senate, but failed in the House owing to the opposition of the country storekeepers; the bill will be again presented to the Legislature. Prof. Simon read a paper on the unit for atomic weights, opposing the selection of oxygen for the purpose. E. M. Foreman, Centreville, was chosen President, J. W. Geiger Secretary, and S. Mansfield Treasurer. The Association will meet again in Baltimore November 13, next.

The Missouri Pharmaceutical Association met at Excelsior Springs, June 9, for three days' work and enjoyment. The address of president Bard, the reports of the secretary, treasurer and of the various committees furnished material for discussions; likewise the papers read, among them one by Prof. Curtman, on testing of chemicals for small amounts of impurities; by G. H. C. Klie, on nitroglycerin, pyroxylin, ground flaxseed and others. The proposed amended pharmacy law, the metric system, cut rates and other subjects received the attention of the meeting, and the resolutions adopted at New Orleans were considered and approved. Dr. Chas Mohr, Mobile, was elected an honorary member. President for the current year is Prof. F. Hemm; secretary Klie, treasurer G. J. Meyer, and local secretary M. Cravens were re-elected. The association adjourned to meet again at the "Elms," Excelsior Springs, June 14, 1892.

The New Jersey Pharmaceutical Association convened at Trenton, May 27, this being the twenty-first annual meeting. In his address, president M. Abernethy suggested the establishment of a State Laboratory under the auspices of the Association, where pharmaceutical preparations should be manufactured and furnished to the members at the lowest cost compatible with the keeping up of the establishment; he expressed the belief that physicians would soon learn that such preparations were made by skilful chemists, uniform in strength and perfect in finish, and that every pharmacist in the State would be desirous of becoming a member of the Association. The suggestion was favorably considered, and a committee of five was appointed, W. Scott Taylor, Trenton, chairman, for elaborating a feasible plan for the establishment of such a laboratory. Papers were read on "Pills, Tablets and Triturates," by J. F. Somerhoff. "Amenities of Business," by Prof. Bedford; "Some Drugs and Foods in the Market," by A. Drescher; "Rock Candy Syrup," by H. J. Lohman; "Aromatic Spirit of Ammonia," by P. E. Hommell, etc. President for the current year is F. R. Danis, Morristown; secretary, C. F. Dare, Bridgeton, and treasurer, W. M. Townley, Newark, were re-elected. Plainfield was chosen as the place for holding the meeting in May, 1892.

The Ohio State Pharmaceutical Association met in Dayton, June 9, at its thirteenth annual meeting, president Heath in the chair. Reports were presented by the different officers and committees, and a number of papers were read on the assaying of drugs and fluid extracts, and on various pharmaceutical preparations. Prof. C. L. Diehl, of Louisville, and A. E. Ebert, of Chicago, were elected honorary members. M. A. Burkhardt, Dayton, is president for the current year; the permanent officers are L. C. Hopp, Cleveland,

secretary, and F. A. Kautz, Cincinnati, treasurer. Next year the association will meet in Canton, June 14.

The Pennsylvania Pharmaceutical Association had for the first time selected a summer resort for its annual reunion, the fourteenth meeting having been called at the Bedford Springs Hotel, located near the northern end of the Cumberland Valley, and about 37 miles south from the main line of the Pennsylvania Railroad at Huntingdon. The springs are about a mile distant from the town of Bedford in the narrow valley of Schober's Run, one of the tributaries of the Juniata; the hills are forest-clad and endowed with an interesting flora. The meeting lasted from Tuesday, June 23, to Thursday, five sessions being held during that time, and was welcomed by Hon. John Cessna and by Chief Burgess McNamara, of Bedford. President J. H. Stein occupied the chair, and delivered a very interesting address, discussing, among other topics, the aims and relation of pharmaceutical education and legislation. The treasurer reported the finances to be in a favorable condition, the cash balance remaining on hand having increased to over $1,000. Among the reports that of the committee on legislation created some discussion as to the causes of the failures of the amendments to the pharmacy law which had been before the legislature during the past year. The subject was referred to a committee, whose report was at a later session adopted; it contained a protest against the clause of the pharmacy law permitting the registration as pharmacists of physicians merely upon proof of three years' medical practice, and without requiring any pharmaceutical experience whatever; and it declared the ultimate object of pharmaceutical legislation to be increased usefulness secured by thorough education. A very pleasing feature of the meeting was the presence of a delegation from the Pennsylvania Medical Association. Dr. Bishop, one of the delegates, advocated concerted action of the two State societies, whereby the desirable and necessary legislation for each profession could be best secured. Only three papers were read at this meeting, one of which is printed in the present number of the Journal. F. H. Gleim contributed a paper on soap liniment, suggesting a reduction of the strength of the alcohol with the view of preventing precipitation. A paper by W. H. Reed discussed the subject of cut rates on proprietary articles. Messrs. Chas. Mohr, Mobile; W. T. Wenzell, San Francisco; Chas. Rice, New York, and C. L. Diehl, Louisville, were elected honorary members. The officers for the current year are: John F. Patton, York, president; W. H. McGarrah, Scranton, and Wm. McIntyre, Philadelphia, vice-presidents. Secretary Miller and treasurer Lemberger, who have served the association in these positions since its organization, were re-elected. The next meeting is to be held at the hotel Shikeliney, Susquehanna Heights, in the immediate neighborhood of Sunbury and Northumberland, June 14, 1892. D. M. Krauser, Milton, was elected assistant secretary.

The Texas Pharmaceutical Association held its twelfth annual meeting at Houston, May 12, President Morrison in the Chair. The transactions consisted of the usual routine business, the president's address, reports of committees and the reading of several papers. George Kalteyer, San Antonio, was elected president; W. F. Shook, Dallas, treasurer, and L. M. Connor, Dallas, secretary. Waco was selected as the place for holding the next meeting May 10, 1892; H. L. Carleton, local secretary.

The Washington Pharmaceutical Association met at Ellensburg, May 11, elected W. P. Bonney, Tacoma, president; H. Dubbs, Seattle, treasurer, and W. St. John, Tacoma, secretary, and adjourned to meet again in Seattle, May 10, 1892.

The Pharmaceutical Society of Great Britain celebrated the fiftieth anniversary of its foundation, Tuesday, May 26, by a reception in the lecture theatre of the Society's building, 17 Bloomsbury Square, London, the President, Michael Carteighe, receiving the visitors. A large number of addresses were presented from pharmaceutic and other scientific societies of Great Britain, France, Germany and Belgium, and by their representatives were read, or the congratulations expressed verbally. A still larger number of congratulatory addresses had come from similar societies, from members and honorary members, and from prominent pharmacists and others residing in different parts of the globe.

The Hanbury Medal was awarded on the same evening (for previous awards, see this Journal, 1889, p. 492) to Dr. Oswald Hesse, of Feuerbach, near Stuttgart, Germany, probably the highest living authority on the chemistry of the cinchona alkaloids, also an investigator of santonin, Calabar bean, coto bark, coca and of many other drugs. The recipient of this mark of distinction, in expressing his thanks, presented in return a valuable monograph, entitled a study of coca leaves and their alkaloids, which has since been published in Pharmaceutical Journal and Transactions.

The Jubilee came to a close by a grand dinner on the following Wednesday evening, at which a number of toasts were proposed and speeches were made by many of the scientists present as visitors.

REVIEWS.

The Pocket Materia Medica and Therapeutics: a Résumé of the Action and Doses of All Officinal and Non-officinal Drugs Now in Common use. By C. Henri Leonard, A.M., M.D., Professor of Medical and Surgical Diseases of Women and Clinical Gynæcology in the Detroit College of Medicine. Cloth, 12mo, 300 pages; price, postpaid, $1.00. The Illustrated Medical Journal Company, publishers, Detroit.

Among the special features of this work may be mentioned the indication of pronunciation of the drug-names, with the genitive case-ending, and the compactness of the information. Non-pharmacopœial names are, as a rule, indicated by an asterisk (*); the common names are given, followed by the dose, and then by the synonyms, English, French and German, in the latter case, however, without paying any attention to the use of the customary capital letters. The descriptions of plants are mostly too brief for botanical recognition; the characterization of the drugs is quite condensed; their action is briefly indicated, and the diseases are mentioned in which their use has been recommended; synergists, antagonists, antidotes and incompatibles are also indicated, and finally the various pharmaceutical preparations of each drug with their doses. The proof-reader has overlooked some errors, like flores arnic*a*, p. 49; berberin*a* sulphas, p. 61; guai(*a*)ci lignum and resina, pp. 138, 139. The book is a

handy and useful remembrancer to the physician, giving information on all pharmacopœial remedial agents, and on a large number of old and of recently introduced drugs.

Veterinary Counter Practice. A treatise on the diseases of animals and the most suitable remedies for them. Written expressly for chemists and druggists by qualified members of the Royal Veterinary Colleges. Published at the offices of the "Chemist and Druggist," London and Melbourne. 12mo, pp. 268. Price, 3*s.* 6*d.*

A popular treatise on diseases of animals and on suitable remedies therefor is here presented, which while mainly intended for the apothecary and druggist, may also be consulted by other intelligent persons interested in domestic animals. Opening with general remarks on the treatment of animals in disease, the veterinary medicines of more general application are next considered and a number of formulas are presented, after which the diseases of the different animals are described and their special treatment indicated. Most of the space is devoted to the diseases of the horse; next to cattle, sheep, pigs, dogs and poultry. An appendix contains a copy of the Veterinary Surgeons Act of 1881, a synopsis of the Contagious Diseases (Animals) Acts, of the British laws relating to the sale of horses, and the veterinary curriculum. A good index renders the consulting of the little work quite easy. The book is intelligently written, suitably illustrated, and appears to well fulfil its aim of presenting suggestions which in many instances will enable the druggist to understand cases detailed to him at his counter and to supply the most suitable remedy.

The Species of Epilobium occurring north of Mexico. By William Trelease. 8vo. pp. 50, and 48 plates.

This monograph is a separate issue from the second annual report of the Missouri Botanical Garden, in which the author critically reviews the North American species of Epilobium, describing thirty-eight, and an additional one, *E. Pringleanum*, Haussknecht, which he had doubtfully described as a variety, *gracillimum*, of *E. Oregonense*, Haussknecht. Several other plants are mentioned which are regarded as hybrids, or some of them possibly as distinct species. The monograph is a very valuable addition to North American botanical literature; the plates are handsomely executed, and plainly illustrate the characteristics of the species.

Proceedings of the Seventh Annual Convention of the Association of official Agricultural Chemists, held at the U. S. National Museum, August 28, 29 and 30, 1890. Edited by Harvey W. Wiley, Secretary of the Association. Published by authority of the Secretary of Agriculture. Washington, 1890. 8vo. pp. 238.

The pamphlet is issued as Bulletin No. 28, Division of Chemistry, U. S. Department of Agriculture. It contains methods of analysis of commercial fertilizers, foods and feeding stuffs, dairy products, fermented liquors and sugars.

Annual Address of the President, Dr. C. A. Crampton, delivered before the Chemical Society of Washington, January 22, 1891, on food preservation and food preservatives. 8vo. pp. 24.

Reprint from Bulletin No. 6 of the Chemical Society of Washington.

Medical Symbolism, in connection with historical studies in the arts of healing and hygiene. Illustrated. By Thos. S. Sozinskey, M.D., Ph.D., etc. Philadelphia and London: F. A. Davis. 1891. pp. 171. Price, $1.00.

A very interesting little work, treating quite fully of medical mythology and the origin and meaning of such symbols like the Æsculapian staff and serpent, the pinecone, tree of life, pentacle, etc. A small chapter is also devoted to pharmacists' symbols, and the author comes to the conclusion that "say 1,000 years before Moses, people were in the habit of having medicines stored in vases of a set kind, and that the Babylonians had considerable pharmaceutical knowledge." The work is posthumous, the author having died two years ago, and is published as No. 9 in the Physicians' and Students' Ready Reference Series.

Aperçu du Premier Rapport du Laboratoire Chimico-Pharmaceutique du Jardin-Botanique de l'Etat de Buitenzorg. Par M. Greshoff. 8vo, pp. 14.

Brief account of the first report from the chemico-pharmaceutical Laboratory of the State Botanical Garden at Buitenzorg.

A reprint from vol. ix of the Annales du Jardin Botanique de Buitenzorg. The interesting results of the investigations carried on by the author, are given in a paper published in our last number, pp. 230–236.

Proceedings of the New Hampshire Pharmaceutical Association, at the seventeenth annual meeting held at The Weirs, September 16 and 17, 1890. Derry: 1891, pp. 37.

The executive officers for the current year are E. H. Currier, Manchester, president; S. H. Bell, Derry Depot, secretary; and F. A. James, Manchester, treasurer. The next annual meeting will be held at Exeter on the second Tuesday of September, 1891.

The Total Eclipse of the Sun, January 1, 1889. A report of the Observations made by the Washington University Eclipse Party at Norman, California. Published by the Academy of Science, of St. Louis. Cambridge: John Wilson & Son, 1891, 4°. pp. 39.

The interesting pamphlet contains seven large illustrations from photographs and drawings made, during the eclipse, of the sun and corona.

How should girls be educated? A public health problem, for mothers, educators and physicians. By William Warren Potter, M.D., of Buffalo. 8vo, pp. 17.

The anniversary address of the President, delivered at the 85th annual meeting of the Medical Society of the State of New York, reprinted from the Transactions.

Ueber eine interessante Reaction des p-Phenetidins und Phenacetins. Von Ludwig Reuter. Heidelberg, 1891, pp. 8.

On an interesting reaction of para-phenetidin and phenacetin.

VARIETIES.

Collodion of Iodol, for covering small abrasions, is made by Pick of iodol 1, ether 5, and pyroxylin 0·5 gm. See also AMER. JOUR. PHAR., 1887, p. 562.

Cocaine dissolved in castor oil was found by Dr. S. Mitchell (*Bost. Med. and Surg. Jour.*) to relieve the pain caused by a corneal ulcer and to favor the healing process.

Powder for Migraine.—Caffeine citrate, 0·10; phenacetin, 0·12; milk sugar, 0·25 gm. If necessary the dose may be repeated in two hours.—*La Médecine moderne.*

Poisoning by Male Fern is reported by Hofmann (*Wien. klin. Wochenschr.*) in the case of a girl 5½ years old, who took 7·5 gm. oleoresin of male fern in three doses within 1¾ hours. A portion of the tape worm was expelled in 1½ hours, then vomiting and somnolence set in, which after three hours, was followed by convulsions and death. The fatal result was presumably caused by impaired resistance due to miliary tuberculosis of the lungs and abdominal glands.

Gelatin paste, recommended by Unna, has been used by Prof. Trendelenberg for flexible dressing, permitting free motion of the parts, and not interfering with the excretory functions of the skin. It is prepared in two degrees of consistence: The thick paste contains gelatin, glycerin and water each 30 parts, with oxide of zinc 10 parts. The thin paste has gelatin 20 parts, glycerin 30 parts, water 40, with oxide of zinc 10 parts. Heat is necessary when the pastes are compounded; it is also needed to liquefy them when they are used. The pastes are readily removed with warm water.—*Jour. Am. Med. Assoc.*, Jan. 10.

Monesia bark from Chrysophyllum glyciphlæum, *Casaretti*, has been studied by P. G. Rozanoff (*Inaug. Dissert. Moscow*, 1890), who considers it to be a very good expectorant, due to the presence of saponin and monesin; abounding in tannin, the bark possesses also valuable astringent properties.